A HINDUSTANI BINET-PERFORMANCE POINT SCALE

With a
Comparision of the Intelligence of Certain
Caste Groups in the Panjab

BY

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FOREWORD

The writer takes this opportunity to express his great obligation to the members of the Department of Psychology of Princeton University, for their valuable suggestions in conference when this study was being projected; and later in correspondence; to Prof. H. C. Warren, for his personal interest and encouragement, both in the U.S.A. and during his visit to India; and in very special measure to Dr. C. C. Brigham, for his guidance at Princeton, and by means of lengthy correspondence during the extended period of the experiment in India. Without his help it would have been impossible to carry the investigation through to its present stage. If at any point the technique is found to be faulty, the writer must assume full responsibility, knowing that such faults could probably have been avoided had it been possible to enjoy Dr. Brigham's direction and to carry out his suggestions at shorter range.

Others who have placed the writer under obligation are Mr. Muhammad Akbar Khan, B.A., LL.B., Mr. Sundar Das, M.A., Mr. Durga Das Chopra, B.A., LL.B., Mr. Mohan Lal Bahl, Mr. J. Beatty, B.A., and Mr. Robert Justin, M.A., all of whom made themselves expert in the administering of the tests, and took great pains in helping to bring the experiment to a conclusion. Thanks are also due to M. Wazir Ali, former Drawing Master, Central Training College, Lahore, Mrs. F. Mowbray Velte and Mrs. C. Herbert Rice, for their kind collaboration in producing the pictures used with the Hindustani scale. Grateful mention must also be made of the continuous interest and assistance of

Mr. H. Wyatt, I.E.S., formerly Principal of the Government Central Training College, Lahore, and now a professor in the University of Oregon.

Acknowledgement must be made of the very kind and generous co-operation of all the headmasters and teachers whose schools were visited.

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PART I

(A) GENERAL DESCRIPTION OF THE EXPERIMENT

§ (1) Introduction

The first stage in the development of the scale here presented was the translation into Urdu, in 1922, of the Stanford-Binet scale, and of parts of the Otis group tests, and the U.S. Army Alpha. The directions for administering certain non-verbal tests in the Army Beta, Pintner-Paterson Performance scale, and Porteus Maze scale were also translated, with or without various modifications and adaptations. The original translation was carried out, under the direction of the writer, by two Indian students of the Forman Christian College, candidates for the B.A., and was subjected to frequent revision by one of the Indian professors of the same college, and by two Indian professors of the Central Training College, Lahore. At a later stage the language of the tests finally chosen was perfected in many conferences between the writer and the four Indian assistant examiners.

These tests were tried out upon a variety of subjects in the Central Training College and Central Model School, Lahore, and in the Government Reformatory School, Delhi. It soon became evident that many of

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the tests were, at least for our present purpose, unsuitable for use in the Panjab. A list of well-known tests eliminated at this stage in the Panjab experiment appears in Part II, § 18. Many considerations led to the rejection of these tests—such as the limits of time, the need for variety, and the securing of material equally familiar to boys of various home and school environments. Thirty-five tests were finally selected, and, after extensive standardization, are here presented in approximate order of difficulty as a Point Scale.

In the remaining pages of Part I will be found the scale as published for use by examiners in India, with complete manual of instructions, tables of norms, and list of materials. In Part II there follows a full account of the examination of 929 Panjabi schoolboys by means of this scale, and of the test results secured. The fixing of age-norms and the validation of the scale are also discussed. In Part III is presented a comparative study of boys of Chuhra parentage (boys from the "depressed classes") with other major caste groups of the province.

(B) THE SCALE AS PUBLISHED, WITH MANUAL OF INSTRUCTIONS

§ (2) Preface

This Hindustani scale is not intended for general sale, but may be supplied to responsible persons who desire to use it in mental examinations or to secure further data with a view to verifying or improving it.

Masters themselves are only too ready to "listen and may try to help their own boys to excel in the . It is obvious that if any such body of tests ld become generally known in a particular school, results in that school would be vitiated, and any r data to which they might be added would be con-ently invalidated. It is not believed that in ordinary ersation between boys who have taken the tests those who have not any considerable amount of mation is conveyed.

§ (3) Sources, Materials and General Instructions

'HE TESTS. The tests used are adaptations of ard tests from the Binet-Simon scale, or its more recent revisions and extensions, with some additional non-verbal tests described in Pintner and Paterson's *Scale of Performance Tests.*[1]

BOOKS REQUIRED. The discussion of these tests in the following pages is so meagre that it will be essential for anyone who undertakes to use them to have at hand at least one of the standard works on the subject, viz., Terman's *The Measurement of Intelligence.*[2]

Another volume of great importance which would be of immense value to any person who undertakes to use this scale is Burt's *Mental and Scholastic Tests.*[3]

Several of the tests require also the use of part of the *Test Material,*[4] published as a supplement to Terman's *Measurement of Intelligence.* It is well to have

[1] Appletons, 1917; price, 10*s.* 6*d.*

[2] Houghton, Mifflin & Co., 1916; price, 7*s.* 6*d.*

[3] London County Council (P. S. King & Sons, Ltd.,); price, 21*s.*

[4] Price, 3*s.* 6*d.* The three books above mentioned, and the test material for the Stanford-Binet scale are procurable from England through any bookseller, and may be expected within five or six weeks.

all this test material in hand in order to understand the discussions in the text. For actual use with the Hindustani scale only the six scoring cards are essential.

MATERIALS REQUIRED. The five Hindustani pictures used are available from the writer, and orders for standard form-boards, weights, etc., will be placed with the Forman College cabinet-maker at reasonable rates. These latter can also, with due precautions, be made up from specifications contained in Pintner and Paterson's *Scale of Performance Tests.*[1] Printed sheets for complete record are also available from the writer. For complete list of materials required cf. § 12.

THE LANGUAGE OF THE TESTS. The tests have been prepared in two versions, Urdu and Panjabi. The Panjabi form is equivalent, phrase by phrase, to the Urdu form. There has been no attempt to secure elegance, or to please those who would relish high-sounding and luscious phrases. It has been our constant endeavour, after extended experiment, to hit upon the simplest and most effective Urdu for the purpose.

The Panjabi is the result of our attempt to render this Urdu, phrase by phrase, into something absolutely equivalent and just as instantly intelligible to a small child in a Panjab village as the Urdu might be supposed to be to an older child in Delhi or Lahore.

ESSENTIAL RULES TO BE OBSERVED. We urgently request every person who uses this scale to observe the following rules:

(*a*) To use the exact phraseology and procedure here laid down.

[1] In the specifications for the Goddard Form-board one most essential point is omitted, viz., the amount of play between the block and its recess. In making up these boards it is essential that in this respect also the apparatus already in use be exactly copied. (Cf. Special Note on the Goddard Form-board, § 20.)

(*b*) In case of sending in any data for evaluation, or for our further records, to state specifically which version has been used; or, in case of using the Urdu and Panjabi as alternative, to specify in which individual tests the Panjabi has been used.

(*c*) In case of any difference of opinion as to the suitability of a particular phrase, to discuss the point with us before introducing any variation.

(*d*) In case of any criticism of our procedure concerning a point which you can possibly regard as *not essential* but merely a matter of taste or preference, to remember that our version has the advantage of having already been used and standardised on a thousand cases.

SUPPLEMENTARY INFORMATION REQUIRED. A word must be added about the supplementary information called for in the examination forms. Every item here is important. *Only four* of these items are to be ascertained by questioning the boy himself, viz., Name, Father's Name, Father's Occupation, and Place of Residence. All other items *must* be verified from authentic records in the school. The Date of Birth is most important. This must be filled in, month and year, from the admission register. We know that even this record may be at fault, but, remembering that the boy himself almost never knows his exact age, and that even the parent is seldom sure without referring to some record, it is the only safe and constant procedure to ascertain age invariably from the admission register.

Age should always be computed subsequently from the dates of birth copied from the register; and preferably not by separate computation, but from a table of ages constructed by the examiner for the month in which he is working. This method prevents many errors of computation.

School, Class, Caste and Social Status are to be filled in by the examiner in consultation with the teacher, and verified as far as possible from school records.

The Teacher's Estimate of Intelligence is to be taken before, and independently of, school marks. In recording School Standing, the number of marks out of a given maximum, secured by the boy during a fixed period (e.g., one year), should first be entered. The relative standing of all the boys in a class or school may be subsequently ascertained from a table of percentages computed and arranged in order of excellence.

It is important that the examiner should sign and date each form when the tests are given.

§ (4) The Order in which Tests are to be Given

A sample scoring sheet is shown in § 5. The order of tests as given in this sheet is to be observed in conducting an examination. In the case of the first ten tests, which constitute the Brief Scale, this order is determined by the necessity of gaining *rapport* with the child, and by a natural logical sequence. No test is so simple and so sure to dispel fear or shyness as the first few lines of the Knox Cubes (Test 1). In the test requiring the comparing and arranging of Weights (Test 2), the materials are not dissimilar, but the language used by the examiner becomes somewhat more difficult. In the Goddard Form-board (Test 3), there is still no language response required from the child, but he invariably comes one step further in his zest to excel himself. The whole examination has become a game to him. In Test 4, Repeating Digits, the child uses his own voice, but does not have to reason or weigh his words. Repeating

Digits Backward (Test 5) follows logically, and in a way has been preceded by a practice series. The introductory word, "*lekin*" ("but") in this test implies that Test 4 has just preceded. The Repeating of Syllables (Test 6) carries oral response further, but does not even yet demand reflection. Test 7, Pictures, serves as the final step in putting the child at his ease, while at the same time it requires discriminating verbal response. The answers to increasingly difficult Questions (Test 8), and the giving of Words (Test 9), may then follow. With the Drawing of the Two Designs (Test 10) the Brief Scale is completed, and almost all forms of response will have become familiar, the child being prepared to complete the examination in an attitude of interested co-operation.

Except where a kind of logical sequence suggests a different grouping, Tests 11-35 are arranged in the general order of difficulty as determined by the pass percentages at the several ages. The types of response required will be found to be sufficiently varied to avoid monotony and fatigue. With two possible exceptions, they should be given in the order shown. Tests 11 and 12, Copying a Square and Copying a Diamond, may be given *before* Test 10, Drawing Two Designs, as a sort of practice series. These three are the only tests in which the child must use a pencil with any great skill. If this order is followed it is, of course, to be noted that the points gained for the Square and Diamond do not enter into the total Brief Scale score. In a similar way, it may be desired to give Tests 13 and 14, Prettier Faces and Missing Features, *before* Test 7, Pictures (Description and Interpretation). In this case, again, the points scored must not be included by mistake in the Brief Scale score.

§ (5) Sample Scoring Sheet

A separate Scoring Sheet, as reproduced in the following six pages, is used for each child examined. The first page is reserved for general information (cf. § 3).

The inner pages of the form give space for the scoring of all the tests of the Point Scale in order. In each case the separate items within the tests are referred to in an abbreviated form which will be clearly intelligible in connection with the full text (cf. § 6). The points scored in the several items as well as in the total are to be noted. Notes upon unusual answers may be indicated by a star and entered on Page 4 of the form. Full directions for the administration and scoring of all tests are given in the body of the text. Seven additional tests are shown, for which data are desired. These are discussed in § 7.

The maximum score for each test is shown in the first column at the right side of the form. In this column the figures emphasised indicate the nine non-verbal tests which constitute the "Non-Verbal Scale," and separate spaces are given for recording the total score on these nine tests.

SAMPLE SCORING SHEET (p. 1)

THE HINDUSTANI BINET-PERFORMANCE POINT SCALE

4TH SERIES, 1924

General Information to be Secured for Each Case Examined

Serial Number.....

Name.....

Date of Birth (from school register)..... ....

Age (at date of examination) ... .

School..... ....

Class..... .....

Father's Name..... ....

Father's Occupation..... ....

Caste.....Sub-caste..... .....

Residence..... .....

Social Status..... .....

Teacher's Estimate of Intelligence:

Very Inferior ( ) Inferior ( ) Average ( )
Superior ( ) Very Superior ( )

School Standing:

Very Poor ( ) Poor ( ) Average ( )
Good ( ) Very Good ( )

Mental Age (PS).....(BS).....(NVS)..... .....

Hindustani Intelligence Quotient (PS).....(BS).....(NVS).....

Examiner.....

Date of Examination.....

SCORING SHEET (pp. 2-3)

No. .....Name.....Age.....Caste.....

Brief Score.....Non-Verbal.....Point Score.....MA.....HIQ.....

Max. Points

1. N-V. KNOX CUBES. Three lines, (1); four lines, (2), etc.

A 1234 ..... C 1432 ..... G 13124 .....
X 12343..... D 1423 ..... H 143124..... ..
Y 12342..... E 13243..... I 132415.....
B 1324 ..... F 14324..... J 142341..... **10**

2. N-V. COMPARING WEIGHTS.

3–15, 21–6, 15–3, all three correct, (1).....

3–6–10–15–21, correct order, three trials, each trial, (1); a..... b..... c..... **4**

3. N-V. GODDARD FORM-BOARD. Best of three trials.

1–9 Secs., (9); 10–11, (8); 12–14, (7); 15–17, (6); 18–20, (5); 21–23, (4); 24–27, (3); 28–35, (2); 36–45, (1); 46 and upward, (0).

First trial..... Second..... Third..... **9**

4. REPEATING DIGITS FORWARD. Two digits, (1); 3, (2); 4, (3); 5, (4); 6, (5); 7, (6).

			F	B
37	64	72	.....	.....
914	286	539	.....	.....
3681	5749	8526	.....	.....
52947	63852	97318	.....	.....
251364	853916	471582	.....	.....
9684751	4827365	5928136	.....	.....
			.....	.....

6

5. REPEATING DIGITS BACKWARD. Two digits, practice series, (0); 3 digits (3 trials), each correct, (1); 4, 5, and 6 digits (3 trials each), each correct, (1). **12**

Max. Points

6. REPEATING SYLLABLES.

"Rām" ..... no error, (1).

"Gāṛī" ..... no error, (1).

"Kẖush".....1 error, (2); 2 or 3 errors, (1); 4 errors, (0).

"Sair".....1 or 2 errors, (2); 3 to 5 errors, (1); 6 errors, (0).

"Guḍḍi".....1 error, (2); 2 or 3 errors, (1); 4 errors, (0).

"Tut".....no error, (1).

"Kẖāmoshī".....no error, (1). 10

7. DESCRIPTION AND INTERPRETATION OF PICTURES.

(*a*) Each picture described in terms of actions and characteristics, (1); (*b*) each interpreted imaginatively, (2). Note that (*b*) includes and implies (*a*).

House.....Village.....Ekka..... 6

8. QUESTIONS. Each correct response, (1).

Sleep ..... Cold ..... Hungry .....

Break..... Late ..... Hurt .....

Opinion ..... Important..... Actions 9

9. WORDS IN TWO MINUTES. Four or less, (0); 5–9, (1); 10–14, (2); 15–19, (3); 20–24, (4); 25–29, (5); 30–34, (6); 35–39, (7); 40–44, (8); 45–49, (9); 50 and upward, (10).

1st half min. ..... 2nd half min. .....

3rd half min. ..... 4th half min. .....

Total..... 10

10. N-V. DRAWING TWO DESIGNS.

Rectangular design A..... (2); B..... (1); C.... (0).

Greek key design a..... (4); b..... (2); c.... (0). 6

Maximum Brief Scale Score 82

	Max. Points
11. N-V. COPYING A SQUARE. Satisfactory drawing, (1).	1
12. N-V. COPYING A DIAMOND. Satisfactory drawing, (1).	1
13. CHOOSING PRETTIER FACES. Three items, each correct, (1). 1..... 2..... 3.....	3
14. MISSING FEATURES. Four items, each correct, (1). Eye..... Mouth..... Nose..... Arm.....	4
15. FINGERS. Right hand.....(1); left hand..... (1); both hands.....(1).	3
16. SIX COINS. All correct.....(2); 1 error..... (1); 2 or more errors.....(0).	2
17. CONCRETE DEFINITIONS. (*a*) By use, each correct definition, (1); (*b*) Superior to use, each correct definition, (2). Sher..... Sipāhī..... Ālū ..... Dukān	8
18. ABSTRACT DEFINITIONS. Each correct definition, (1). Rahm..... Badlā..... Khairāt..... Hasad..... Insāf.....	5
19. ADDING 3 2-ANNA AND 3 1-ANNA PIECES. Correct answer, (1).	1
20. COUNTING BACKWARD FROM 20 TO 1. Correct, or only 1 error, (1); more than 1 error, (0).	1
21. MAKING CHANGE. 8–3..... (1); 12–9..... (1); 16–3.....(1).	3
22. N-V. ADAPTATION BOARD. Five moves. 1..... (1); 2..... (1); 3..... (1); 4..... (1); 5..... (1).	5
23. N-V. OBLONG CARD. Correct placing, (1).	1
24. COLOURS. Red ..... (1) Green ..... (1) Blue ..... (1) Yellow ..... (1)	4

Max. Points

25. DIFFERENCES.
Wood-glass..... (1); Stone-egg..... (1);
Milk-water..... (1). 3

26. SIMILARITIES BETWEEN TWO THINGS.
Iron-silver..... (1) Ber-āmm..... (1)
Gaḍḍā-tonga..... (1) Wood-coal ..... (1) 4

27. SIMILARITIES BETWEEN THREE THINGS.
Sāṇp-gāe-chiṛīyā..... (1)
Kitāb-ustād-akhbār..... (1)
Ūnn-rūī-chamṛā..... (1)
Chāqū-paisā-kīl..... (1)
Phūl-ālū-darakht..... (1) 5

28. WORDS IN SENTENCES. Three items. Three words in one sentence, each correct item, (2); three words in two sentences, each correct, (1).
Laṛkā-gend-daryā..... (1) or (2)
Kām-rupāyā-ādmī..... (1) or (2)
Rāsta-bazār-bāgh..... (1) or (2) 6

29. BALL AND FIELD. Stanford samples, 1–5, (5); 6, 8, and 10, (4); 7, 9, 12, 13, 18, (3); 11, 14, 15, 16, 17, 19, 20, (2); 21, 22, 23, (1); 24 to 30, (0).
..... 5

30. RHYMES. Two good rhymes for either word, (1); two good rhymes each for both words, (2); three or more for one, and at least two for the other, (3).
Āg..... ( ); Kab..... ( ). 3

31. ABSURDITIES.
Horse..... (1) Girl..... (1)
Train ..... (1) Fall..... (1) 4

32. PAPER TEST.
Drawing holes..... (1)
Finding the Rule 1..... (1); 2..... (1);
4..... (1); 8..... (1); 16..... (1). 6

		Max. Points
33.	N-V. HEALY FORM-BOARD. Forty secs. or less, (3); 41–80 secs., (2); 81–120 secs., (1); more than 120 secs., (0).	3
34.	ENCLOSED BOXES. 121... ..... (1); 122..... (1); 133..... (1); 144..... (1).	4
35.	RAJAH AND DEPUTY COMMISSIONER. Each correct difference, (1). *a*..... (1) *b*..... (1). *c*..... (1)	3
	Maximum Point Scale Score.....	170
	Maximum Non-Verbal Score.....	40

SEVEN ADDITIONAL TESTS.

A1. NAMES: *Knife*....., *Pen*....., Key.....

A2. REPEATING SEVEN SYLLABLES: Dog....., Cat....., Hot.....

A3. LONGER LINES: (*a*) ....., (*b*) ....., (*c*).....

A4. TRIPLE ORDER: Knife....., Door....., Box.....

A5. COUNTING THIRTEEN PICE: .....

A6. CLOCK PUZZLE: (*a*) ....., (*b*) ....., (*c*) .....

A7. INGENUITY TEST: 357....., 578....., 497.....

THE TEXT OF THE TESTS

§ (6) Text of the Tests, with Procedure, Notes, and Directions for Scoring

Under each test will be found (*a*) "Procedure," i.e. the exact words to be used by the examiner in administering the test; (*b*) "English Version," a close English translation of the Hindustani test; (*c*) "Notes," more fully descriptive of the test, or of examining method; and (*d*) "Scoring," fully explaining the assignment of points to the items of the test.

The Hindustani is done into Roman type, fully pointed, except where a bold unpointed type has been used to indicate stress. The pointed Urdu is completely phonetic. What we have called the "English Version" is not a standard English version of the test. Nor is it an English equivalent of our Hindustani test intended for use in examining children.[1] It is a fairly literal (in many cases an awkwardly literal) translation of the Hindustani test, and is only introduced for the purpose of comparing the character and difficulty of the Hindustani test with that of the original English test on which it is based. Such comparison will in every case of great divergence suggest some problem of adaptation which has necessitated change. It is also possible thus to detect by mere inspection many cases of supposedly "equivalent" tests which are not really of equal difficulty.

It may be noted that the first ten of these tests constitute the Brief Scale, discussed in §§ 11, 28 and 29.

[1] Some teachers might prefer to exhibit their own and their pupils' English rather than to employ the vernacular tests!

The nine Non-Verbal tests (cf. § 12) are marked NV, and their serial numbers are printed in bold type..

1. N-V. Knox Cubes (P.P. Test XV, p. 67).[1]

PROCEDURE: *Achchhī tarah dekho, aur jāise maiṇ karūṇ, wāise hī tum bhī karo.*

ENG. VER.: Watch carefully, and as I do, you do in the very same way.

NOTES. Five similar cubes, one inch in each dimension, are employed. One of these is used for tapping. The other four are fastened to a base at a distance of one inch apart. They are thus kept correctly and permanently spaced. Even so, school desks and tables are often so uneven that special precaution has to be taken in order that the block of cubes may not tilt or twist while it is being tapped.

The examiner taps the blocks with the fifth cube, from his right to his left, line by line, in the order shown in the table printed in the scoring sheet, the speed being about one tap per second. The child standing opposite taps from his left to his right. After each line the examiner places the cube on the table in front of the child, at a convenient point near the child's right hand, this serving as a gesture indicating that he is to pick it up at once and proceed.

[1] Full discussion of the originals of these tests may be found in the sources cited immediately after each title. The abbreviations used are as follows:

"S.R.", Stanford Revision, cf. Terman, op. cit., Age and Serial Number of test indicated.

"B.", Burt, cf. Burt, op. cit. (London County Council Tests), Serial Number of test indicated.

"P.P.", Pintner and Paterson, op. cit., No. of test, and page indicated.

"B S.", Binet-Simon, 1911 Scale; cf. Binet and Simon, *The Development of Intelligence in Children*, Kite's translation, pp. 274 ff., Age and Serial Number of test given.

The examiner continues until the child fails at least three times in succession, marking each line in the scoring sheet with a plus or a minus, as the case may be. Care should be taken not to distract or discourage the child by marking the score in a conspicuous manner.

The position of examiner and child facing each other, and of the four blocks on the table, is shown in the following diagram:

CHILD

4	3	2	1

EXAMINER

It will be seen that the blocks from 1 to 4 are from right to left for the examiner, and from left to right for the child.

SCORING. For only 1 or 2 lines passed, (0); for 3 lines passed, (1); 4 lines, (2); 5 lines, (3); etc., etc., to 12 lines passed, (10). Maximum score, (10).[1]

2. N-V. Comparing and Arranging Weights (S.R. V 1, IX 2; B. 46; B.S. X 1).

(I) COMPARING TWO WEIGHTS. (*a*) 3-15; (*b*) 21-6; (*c*) 15-3.

PROCEDURE:

(*a*) *In do ḍibbioṇ meṇ se kaunsī bhārī hai?*
(*b*) *In donoṇ meṇ se?*
(*c*) *In donoṇ meṇ se?*

ENG. VER.:

(*a*) Of these two little boxes, which is the heavy one?

[1] For further discussion of this test cf. Pintner and Paterson, *Scale of Performance Tests*, p. 68.

(*b*) Of these two?
(*c*) Of these two?

NOTE. In the first part of the test three pairs of greatly differing weights are placed before the child. The pairs are (*a*) the 3- and 15-gram weights; (*b*) the 21- and 6-gram weights; and (*c*) the 15- and 3-gram weights. The order given prevents guessing.

SCORING. The child must indicate the heavier weight correctly in ALL THREE trials. Maximum score, (1).

(II) ARRANGING FIVE WEIGHTS.

PROCEDURE: *Yih ḍibbiāṇ jo haiṇ, ek jāisī dikhāī deṭī haiṇ yā nahīṇ? Hāṇ, lekin ek jāisi nahin haiṇ. Har ek ke bojh meṇ farq hai.*

Ab sab se bhārī lekar (pointing to the place) *is jagah rakho.*

Aur us se halkī (pointing) *is jagah; phir* (pointing to the next place) *jo us se halkī; aur sab se halkī is jagah. Shuru' karo.*

(If the child hesitates,) *Sab se bhārī is taraf, aur sab se halkī is taraf.*

ENG. VER.: These little boxes here appear to be all alike, don't they? Yes, but they AREN'T all *alike. Each one's WEIGHT is different.*

Now take the heaviest and put it in (pointing to the place) THIS spot, and the one next lighter than it (pointing) in THIS spot; THEN (pointing), the one lighter than it—and the lightest of all in (pointing) THIS spot. Begin.

(If the child hesitates,) The heaviest one on THIS side and the lightest one on THIS side.

NOTES. The crucial phrase, *Har ek ke bojh men farq hai*, is simple and explicit. The word *bojh* is always understood by young children. This is not true of *wazn* or other terms which might be used for "weight."

The weights used are small-sized Japanese match boxes, 14 × 23 × 43 mm., or $\frac{1}{2} \times 1\frac{1}{8} \times 1\frac{3}{4}$ ins. in dimension. They are weighted, stuffed with cotton, and glued shut. Outside they are coated with black enamel, making them absolutely uniform as well as neat in appearance. Stout uniform pill boxes similarly prepared and of proportionate weight are also suitable.

In the Binet tests the weights used are 3, 6, 9, 12, and 15 grammes. As the proportionate differences are much less between the heavier weights than between the lighter ones, children often make chance errors in judging the heavier boxes, even though their method convinces the examiner that they fully understand the problem. As this test is not intended to measure sensory acuity, it seems desirable to lessen the likelihood of such errors by increasing the proportionate differences between the weights at the heavier end of the series. For this reason we have fixed our weights at 3, 6, 10, 15, and 21 grammes. Thus the proportional increments are still not constant, but instead of 100, 50, 33, and 25 per cent., as in the old series, they are now 100, 66, 50, and 40 per cent. respectively.

We have used on the boxes the distinguishing marks suggested by Burt, viz. BINET, to avoid the necessity of the examiner's re-weighing the boxes after they have been arranged by the child. In tolas our boxes weigh $\frac{1}{4}$, $\frac{1}{2}$, $\frac{5}{8}$, $1\frac{1}{4}$, and $1\frac{3}{4}$ t.

The five boxes are placed in a chance order with the lettered sides down before the child, and are mixed like a hand of dominoes before his eyes.

SCORING: Three trials are given. Score for each correct arrangement, (1). Maximum score, (3).

3. N-V. Goddard Form-board (P.P. Test II, p. 30).

PROCEDURE: *In ṭukṛoṇ ko in kī apnī apnī jagah meṇ rakhnā hai. Dekheṇ tum kitnī jaldī rakh sakte ho.*

Shuru' karo.

Phir rakho, aur jaldi karo.

Phir rakho, bahut jaldi rakho.

(If any block is tilted or not exactly placed.) *Ṭhīk ṭhīk rakho.*

ENG. VER.: These pieces are to be put each in its own place. Let us see how fast you can put them in. Begin.

Put them in again, and do it QUICKLY.

Put them in again, put them in VERY fast.

(If any block is tilted or not exactly placed.) Put them in just right, exactly.

NOTES. The Goddard Form-board, known otherwise as the Seguin Form-board, is described by R. H. Sylvester in his monograph on "The Form-board Test."[1] The reader should consult also the special discussion of the Goddard Form-board, relative to a lack of completeness in Sylvester's specifications, cf. § 21.

The method of giving the test as quoted by Pintner and Paterson is as follows:

[1] Sylvester, R. H., *Psychological Monographs*, Vol. XV, No. 4, Whole No. 65 (1913).

"The Form-board lies horizontally on a table, its lower edge even with the edge of the table next to which the child stands. The table must be low enough to allow him to lean well over the board and to look down upon its center. The blocks are placed in three piles on the table, next to the upper edge of the board, no block in the pile nearest its recess, the lozenge and the elongated hexagon not in the same layer, and the star in the lower layer. This is the arrangement at the beginning of each of the three trials. The child is introduced to the test with no introduction concerning it except, 'Let us see how quickly you can put the blocks into place.' His first reactions and his behaviour until he succeeds in getting the blocks into place or fails are carefully studied. After this first trial he is given any instruction necessary to make him understand where the blocks belong and that he is to replace them as quickly as possible. Then he is given a second and third trial, in which he is encouraged and urged in every way to make the best record of which he is capable."

A record of the time of each of the three trials is kept. The best of the three trials is the child's final score on this test. The Form-board with the blocks all in place is ordinarily left exposed on the examiner's table. When the test is to be given to the child it is placed before him, and the blocks are removed from their places and put in the three piles before his eyes. No further demonstration or explanation than that included in the two sentences given above under "Procedure" is ever found necessary.

SCORING. Nine seconds or less, (9); 10-11 secs., (8); 12-14 secs., (7); 15-17 secs., (6); 18-20 secs., (5); 21-23 secs., (4); 24-27 secs., (3); 28-35 secs., (2); 36-45 secs., (1); 46 secs. or more, (0). Maximum score, (9).

4. Repeating Digits Forward (S.R. III Al., IV 6, VII 3, X Al. 1; B. 2, 8, 18, 28, 41, 52; B.S. VIII 5).

PROCEDURE: *Suno. Jo kuchh maiṇ bolūṇ, tum mere pīchhe bolo. Pahle achchhī tarah suno aur phir mere pīchhe bolo.*

37	64	72
914	286	539
3681	5749	8526
52947	63852	97318
251364	853916	471582
9684751	4827365	5928136

ENG. VER.: Listen. Whatever I say, you say (it) after mē. FIRST carefully listen, and THEN say (it) after me.

NOTES. It is necessary to stress the words printed in bold type as it is a common practice in schools to ask children to repeat word by word, or phrase by phrase, after the teacher. They are always ready to break in, expecting him to pause after two or three syllables. In all the Digits tests, and in Repeating Syllables this precaution has to be taken. If it is not taken the child is almost sure to spoil the test by making necessary a repetition of the digits or words. In case such a repetition has to be made in either of the Digits tests, other combinations of digits from the blocks of figures are to be given.

In this test the child is given three trials with each item. As soon as he has correctly repeated 2 or 3 or 4 digits, etc., as the case may be, the examiner may proceed directly to the next higher number. The digits must be pronounced without rhythm or emphasis, at a rate of two per second.

The blocks of figures are from Burt.[1]

[1] For further discussion of procedure cf. Burt op. cit., p. 25.

SCORING. Two digits correctly repeated, (1); 3 digits, (2); 4 digits, (3); 5 digits, (4); 6 digits, (5); 7 digits, (6); Maximum score, (6).

5. Repeating Digits Backward (S.R. III Al. 2, IX 4, XII 6, XVI 5, XVIII 5).

PROCEDURE: *Ab jo maiṇ kahūṇ, tum mere pīchhe bolo, lekin ulṭā karke bolo.*

Agar maiṇ bolūṇ, "3, 7," *tum bolo* . . . . "7, 3." (If necessary,) *Agar maiṇ bolūṇ* "6, 4," *tum kyā bologe?* . . . "4, 6."

ENG. VER.: Now what I say, you say after me, but turn it about and say it.

If I say "3, 7," you say . . . . "7, 3."

(If necessary add,) If I say "6, 4," what will you say? . . . . "4, 6."

NOTES. Contrary to Terman's direction[1] for which he offers no reason, we give this test immediately after Repeating Digits Forward. It seems greatly to simplify the language necessary for explaining what is to be done, and does not apparently increase or decrease the difficulty of the test itself. In the second sentence used by the examiner, the child almost invariably breaks in with "7, 3," as he is encouraged to do by the examiner's intonation and pause, "*tum bolo* . . . ." In such case the third sentence becomes unnecessary.

In this test all three trials must be given with each successive number of digits, until the child has failed an entire line.

SCORING. Two digits, practice series, (no score);

[1] Cf. Terman, op. cit., p. 207.

3 digits, 3 trials given, each correct response, (1)—total, (3); 4 digits, each correct response, (1)—total, (3); 5 and 6 digits, similarly, each correct response, (1)—total, (6). Maximum score, (12).

(This test may be extended, and points awarded similarly, in case any child can go on to 7 or 8 digits backward.)

6. Repeating Syllables (S.R. III 6, IV Al., VI. 6; B. 7, 14, 30, 59; B.S. XV 3).

PROCEDURE: *Jo kuchh maiṇ bolūṇ, tum mere pīchhe bolo. Achchhī tarah suno.*

(If necessary), *Nahīṇ, jab maiṇ bol chukūṇ, tab mere pīchhe bolo.*

(*a*) *Us kā nām Rām hai. Wuh achchhā laṛkā hai.*

(*b*) *Gāṛī chaltī hai, aur sīṭī bajtī hai.*

(*c*) *Is waqt ham bahut khush haiṇ, aur hamārā chhoṭā kuttā bhī khel rāhā hai.*

(*d*) *Ham lambī sair kareṇge. Jaldī se mujhe merī achchhī ṭopī de do.*

(*e*) *Mohan apnī chhuṭṭīoṇ meṇ bahut khush rāhā. Wuh har roz guḍḍī uṛātā thā.*

(*f*) *Tūt kā darakht kā sāyā, jis ke nīche bachche khel rahe haiṇ, bahut 'umda aur ṭhaṇḍā hai.*

(*g*) *Ab qarībaṇ deṛh bajā hai. Ghar meṇ bilkull khāmoshī hai, aur billī so rahī hai.*

ENG. VER.: What I say, you say after me. Listen carefully. (If necessary.) No, when I have FINISHED speaking, THEN speak after me.

(*a*) His name is Rām. He is a good boy.

(*b*) The train is moving, and the whistle is blowing.

(*c*) Now we are very happy, and our little dog is playing too.

(*d*) We are going to take a long walk. Quickly give me my good hat.

(*e*) Mohan was very happy during his holidays; he was flying kites every day.

(*f*) The shade of the mulberry tree, under which the children are playing, is very beautiful and cool.

(*g*) Now it is about half past one o'clock. In the house there is absolute stillness, and the cat is sleeping.

NOTES. In order to prevent the child's breaking in, the examiner should take care not to hesitate or to allow his voice to fall after the first phrase or clause of any of the sentences.

The preliminary conversation given by Terman for the Stanford tests, III 6 and IV A1., is not necessary. We give this test after the Digits tests, when the idea of repeating exactly what the examiner has said is still fresh in the child's mind.

All of our sentences are similar to those given by Terman. Certain ideas contained in the Stanford and the London sentences are obviously unsuitable for Panjabi children, as, e.g. going fishing, catching a mouse in a trap, apple tree, straw hat, snow in winter. It may even be that an expression such as "I have a little dog" would introduce unnecessary complications, as domestic dogs are not common in Indian houses and are peculiarly offensive to orthodox Muhammadans.

SCORING. Sentence (*a*) without error, (1). (*b*) Without error, (1). (*c*) Correct, or with only one error, (2); 2 or 3 errors, (1); 4 errors, (0). (*d*) Correct, or with only

1 or 2 errors, (2); 3 to 5 errors, (1); 6 errors, (0). (*e*) Correct, or with only one error, (2); 2 or 3 errors, (1); 4 errors, (0). (*f*) Without error, (1). (*g*) Without error, (1). *Maximum score, (10).*

7. Description and Interpretation of Pictures (S.R. III 3, VII 2, XII 7; B. 6, 29, 56; B.S. VII 2, XV 4).

PROCEDURE: *Is taswīr ko gaur se dekho, aur is kī bābat sab kuchh batāo.*

(If necessary, repeat, or add,) *Is kā matlab kyā hai?*

ENG. VER.: Look at this picture intently, and then explain (to me) everything about it.

(If necessary add,) What does it mean? or repeat.

NOTES. The pictures used for American children with the Stanford revision are obviously out of the question for the Panjab, and the Binet pictures are quite impossible. The unfamiliarity of the scenes gives one to expect little more than enumeration of objects. Even the objects themselves are unfamiliar, as, e.g., eggs in a basket, or a canoe in the rushing river.

We have prepared three pictures keeping in mind the necessity of depicting scenes equally familiar to city and country children in the whole of North India. The type of scene represented in the first three of the Stanford pictures has been roughly adhered to. Thus (*a*) our Household Scene may be said to correspond to *the Dutch Home, (b) our Village scene to the Post* Office picture, and (*c*) our Traveller Hailing a Cart to the Canoe picture.

Our phraseology is the result of much experimentation and seems to be fully satisfactory. The phrase, *Is kī bābat sab kuchh batāo* (Tell me all about it) seems

to include all the possibilites of reply as well as to avoid suggesting mere enumeration. The subsequent phrase, *Is kā matlab kyā hai?* (What does it mean?) is added in case the boy does not give a superior answer on his own account. This is not equal to telling him to make up a story about the picture, but seems a legitimate aid in case he is just about to do so but does not know whether to risk it or not.

Replies are evaluated as in Terman.[1] Mere enumeration of objects proves too easy for the ages with which we have dealt, and consequently does not entitle to credits in our schedule of scoring.

SCORING. (*a*) For each picture described in terms of actions and characteristics, (1); (*b*) for each picture interpreted imaginatively, (2). Note that (*b*) includes and implies (*a*). Maximum score, (6).

8. Questions (S.R. IV 5, VI 4, VIII 3, X 5; B, 37, 50; B.S. IX 5, X 4).

PROCEDURE: (*a*) *Jab tumheṇ nīnd āe, to tumko kyā karnā chāhīye?*

(*b*) *Jab tumheṇ sardī lage, to tumko kyā karnā chāhīye?*

(*c*) *Jab tumheṇ bhūk lage, to tumko kyā karnā chāhīye?*

(*d*) *Jab tum se kisī aur kī chīz ṭūṭ jāe, to tumheṇ kyā karnā chāhīye?*

(*e*) *Agar school jāte waqt rāste meṇ der hone kā ḍar ho, to tum ko kyā karnā chāhīye?*

(*f*) *Agar tumhāre sāthī se tum ko achānak choṭ lag jāe, to tum ko kyā karnā chāhīye?*

[1] Cf. Terman op. cit., pp. 190 ff. and 302 ff.

(*g*) *Jab tumheṇ koī ādmī us shakhs kī bābat kuchh pūchhe, jis ko tum achchhī tarah se nahīṇ jānte, to tumheṇ kyā karnā chāhīye?*

(*h*) *Jab tum ek bahut zarūrī bāt ko shuru' karne lago, to tumheṇ kyā karnā chāhīye?*

(*i*) *Kyā waja' hai ki hameṇ kisī shakhs kī pahchān us kī bātoṇ se nahīṇ balki us ke kāmoṇ se karnī chāhīye?*

ENG. VER.: (*a*) When sleep comes upoṇ you, what should you do?

(*b*) When you get cold, what should you do?

(*c*) When you get hungry, what should you do?

(*d*) When by you a thing belonging to somebody else is broken, what ought you to do (about it)?

(*e*) If at school-going time, on the way, fear of being late should come upon you, what ought you to do?

(*f*) If by a companion accidentally (suddenly), an injury should be done to you, what ought you to do?

(*g*) When somebody asks you anything about a man whom you don't know very well, what ought you to reply?

(*h*) When you are about to begin some very important thing, what ought you to do?

(*i*) What is the reason that we ought to estimate (recognise) a man not from his words but rather from his deeds (works)?

NOTES. Questions (*a*), (*b*) and (*c*) are obviously very simple. If they are failed, the examiner need not pro-

ceed with the harder questions. If they are passed, all of the remaining six questions must be given. While the second group of three questions is, in general, easier than the third group, it cannot be inferred that a child who fails in them will also fail in those that follow.

Terman's analysis of responses to equivalent questions is quite adequate.[1]

Repetition is permitted, but no change in the wording, except in (*f*). The word *achānak* seems sometimes to offer difficulty, and, if necessary, this question may be repeated in the following form: "If a playmate hits you, but does not hit you knowingly and with intention, what . . . ?" i.e., *tum ko māre, par jān būjh ke na māre.* The Hindustani phrase, *jān būjh ke*, "knowingly and with intention," is immensely simpler than its English equivalent would suggest.

In (*e*) if the answers are suspicious, the practice of the particular school is enquired into; and in (*f*) if both forms of the question have been given, retaliatory sentiments are rejected.

One very characteristic reply to question (*h*) on the part of a Muhammadan boy is "Repeat the sacred phrase, 'Bismillah.'" This answer is, of course, to be counted correct.

SCORING. There are nine questions in all. For each correct response, (1). Maximum score, (9).

9. Words in Two Minutes (S.R. X 6; B. 51; B.S. XII 3).

PROCEDURE: *Tum do miniṭ meṇ kitne lafz bol sakte ho? Jitne lafz tum ko ate hain jaldī jaldī bolte jāo. Maiṇ ginūṇgā.*

[1] Cf. Terman, op. cit., p. 268.

Jo lafz chahte ho, bolo, jāise ki "bādal," "kuttā," "mez," "khush," "sabz," . . . . Bolo.

ENG. VER.: In two minutes how many words can you say? As many words as you know, quickly go on saying them. I will count them. Whatever word you wish, say it—such as "cloud," "dog," "table," "happy," "green," . . . . Speak (go on).

NOTES. The three-minute test in the usual form seemed to us to be unnecessarily long drawn out, the third minute not really supplying additional data of significance, but adding greatly to the fatigue and monotony of the examination.

The five type-words given here are not all nouns as in Yerkes' and Burt's similar tests. One adjective is added to Terman's list to avoid starting the child on any particular and limited set of associates. If the child includes these same words in his reply, they are counted.

SCORING. The number of real words given in each half-minute period is indicated in the scoring sheet. Repetitions are not counted. For 4 words or less in 2 minutes, (no score); 5-9 words, (1); 10-14, (2); 15-19, (3); 20-24, (4); 25-29, (5); 30-34, (6); 35-39, (7); 40-44, (8); 45-49, (9); 50 and upward, (10). Maximum score, (10).

10. N-V. Drawing Two Designs (S.R. X 3; B. 48; B.S. X 2).

PROCEDURE. *Ab maiṇ do shakleṇ* (show for a mere instant) *dikhāūṇgā, aur phir chhipā lūṇgā. Bilkull thoṛe waqt ke liye dikhāūṇgā. Tum dekh lo, aur phir is jagah khencho.* (Hand the child a pencil.)

Ab dekho (show the designs, and note the time); *achchhī tarah dekho. Dekhte raho. Donoṇ ko dekho.*

(Placing designs face downward on the table,) *Ab (is jagah) khenṇcho.*

ENG. VER.: Now (here are) two figures (show for the merest instant) which I am going to show you; and then (placing face downward), I will hide them. For a *very short* time I am going to show them to you. You look at them and then in this space (pointing) draw them. (Hand him a pencil.) Now look! (Show the designs and note the time.) (While he examines them, say at regular intervals,) Look carefully. *Keep* looking. Look at them *both.* (At the end of ten seconds hide the card and say,) Now draw them *here.*

NOTES. In this test there is a tendency for the child to become involved in the attempt to remember a somewhat intricate set of directions and explanations, and to waste time that should be given to examining the drawings. There is also an almost irresistible tendency to begin the drawing, or to reach for a pencil, when only one design has been examined. Our procedure requires much practice on the part of the examiner, but prevents the common errors mentioned. No unnecessary explanation of *shakleṇ* (figures) is required, as the fleeting glimpse of them is sufficient to let the child know that he will have to deal with simple black line designs. Paper, pencil, place, are all indicated at natural points largely by means of gesture. The three short phrases thrown in during the ten-second period do not distract

but serve rather to sharpen attention, and prevent partial or interrupted examination.

Terman's figures and scoring-card are used.[1]

SCORING. (*a*) The drawings of the rectangular design are marked *A*, *B* and *C* respectively, according to the Stanford chart of "correct," "half-correct," and "unsatisfactory" attempts.

(*b*) The drawings of the "Greek key" design are in the same way marked *a*, *b* and *c*.

Rectangular designs: *A* drawings, (2); *B* drawings, (1); *C* drawings, (0).

Greek key designs: *a* drawings, (4); *b* drawings, (2); (*c*) drawings, (0). Maximum score, (6).

THE ABOVE TEN TESTS complete the Brief Scale. Maximum Score in the Brief Scale, (82).

11. N-V. Copying a Square (S.R. IV 4).

PROCEDURE: *Is shakl ko dekho. Ab tum isī tarah kī ek shakl banāo. Is jagah khencho.*

ENG. VER.: Look at this figure. Now you make a figure just like this. Draw it here.

NOTE. A square figure one and one-half inches on a side is shown to the child (cf. list of materials, § 12). Terman's scoring-card is used in judging satisfactory and unsatisfactory drawings.

SCORING. For a satisfactory drawing, (1). Maximum score, (1).

12. N-V. Copying a Diamond (S.R. VII 6).

PROCEDURE: *Ab is kī naql karo. Is jagah isī tarah kī ek shakl khencho.*

[1] Cf. also Terman, op. cit., p. 260.

ENG. VER.: Now make a copy of this. In this spot draw a figure just like this.

NOTE. A diamond $2\frac{3}{4}$ inches long, and $1\frac{1}{2}$ inches broad, drawn in heavy black lines (cf. list of materials, § 12), is shown in the upright position to the child.

SCORING. Terman's scoring card is used in judging satisfactory and unsatisfactory drawings. For satisfactory drawing, (1). Maximum score, (1).

13. Choosing Prettier Faces (S.R. V 3; B. 11; B.S. VI 5).

PROCEDURE: (*a*) *In do taswīroṇ ko dekho. In meṇ se kaunsī khūbsūrat hai?*

(*b*) and (*c*) *In meṇ se kaunsī khūbsūrat hai?*

ENG. VER: Look at these two pictures. Which of them is the pretty one?

(*b*) and (*c*) Which of *these* is the pretty one?

NOTES. It is possible that the original Binet drawings might have given satisfactory results. It was thought better, however, to prepare a series of drawings using Indian types of faces. It is possible that the European features, and the absence of familiar head-coverings would affect an Indian child's judgment on the Binet pictures in this test and in test No. 14.

There seems to be no unnecessary diffidence about applying the term "beauty" to a masculine face. The world *Khūbsūrat* (beautiful) is used interchangeably for *handsome* and *pretty*. It has seemed simpler to use *taswīr* (picture) than *chihrā* (face, or countenance) or *mūṇh* (mouth, face).

The pairs of pictures are exhibited separately.

SCORING. Three items. For each correct response, (1). Maximum score, (3).

14. Recognizing Missing Features (S.R. VI 2; B. 32; B.S. VIII 3).

PROCEDURE: *Is taswīr meṇ kyā nuqs hai?*

(If necessary,) *Kis chīz kī kamī hai?*

(If the child says, "It has no body.") Chihre kā kaunsā hissā kam hai?

ENG. VER.: In this picture what defect is (there)?

(If necessary add,) What thing is omitted?

(If the child says, "It has no body.") What part of the *face* is missing?

NOTE. The Binet pictures have not been regarded as suitable to the Panjab. Apart from the unfamiliarity of the European type of face, there is the likelihood that the absence of turban or veil would suggest wrong answers otherwise avoidable. We have prepared simple drawings of Indian types which are suitable to Panjabi children, and which have the advantage of being less unpleasing *as pictures* (cf. § 13).

SCORING. Four items. For pointing out the missing *eye*, (1); *mouth*, (1); *nose*, (1); *arm* (or *hand*), (1). Maximum score, (4).

15. Giving Number of Fingers (S.R. VII 1; B. 20).

PROCEDURE: *Tumhāre daihne hāth meṇ kitnī uṇglīāṇ haiṇ?*

Bāeṇ meṇ kitnī haiṇ? Donoṇ hāthoṇ meṇ kitnī haiṇ?

(If necessary add,) *Nahīn, ginno mat; bagair gine ke batāo.*

ENG. VER.: On your right hand how many fingers are (there)?

On your left how many are there?

On both hands how many are there?

NOTE. A child who gives the answer, 4 on the right, 4 on the left, and 8 on both, is questioned further. If his answer shows that he was consciously discriminating between *uṇglīāṇ* (fingers) and *aṇgūṭhā* (thumb), he is given credit for a correct answer.[1]

SCORING. Right hand, correct reply, (1); left hand, (1); both hands, (1). Maximum score, (3).

16. Naming Six Coins (S.R. VI 5; B. 25, 43; B.S. IX 3).

PROCEDURE: (Pointing,) *Yih kyā hai?*

(If necessary,) *Hāṇ, lekin is ko tum kyā kahte ho?*

ENG. VER.: What is this?

(If necessary add,) Yes, but what do you call *this* piece?

NOTES. The coins used are the silver rupee (*rupāyā*), the silver eight-anna piece (*aṭhannī*), the silver four-anna piece (*chawannī*), the silver two-anna piece (*duannī*), the nickel one-anna piece (*ānnā*), and a copper pice (*paisā*). The nickel 8-, 4- and 2-anna pieces are fairly common by this time, but may not be so universal in the country as the older coins. The values of these coins are roughly the same as those of the coins chosen in England and America for a similar test. They may be called the "Six Commonest Coins."

[1] Cf. Burt, op. cit., p. 35; Terman, op. cit., p. 189.

The examiner repeats the question as above, pointing to each coin in succession. Neither examiner nor child should handle the coins or turn them over. If the child replies at first with a generic term, the second question is asked with the emphasis on the word *is* (this).[1]

SCORING. All six coins correctly named, (2); five correctly named, but one omitted or in error, (1); two or more errors, (0). Maximum score, (2).

17. Concrete Definitions (S.R. V 4, VIII 5; B. 27, 45; B.S. VI 2, IX 2).

PROCEDURE: *Sher kyā hai?* (If necessary,) *Sher kyā chiz hai? Sipahi kya hai?* Alu *kyā hai? Dukan kyā hai?*

ENG. VER.: What is a *tiger?* (If necessary,) What *thing* is a tiger? What is a *soldier?* A *potato?* A *shop?*

NOTES. Of the words used in the West for this test it was thought that *chair*, *fork* and *table* might not be equally familiar to city and country children. Chairs and tables are not universally used as domestic furniture, and forks are not used at meals. The word for fork is also identical with the word for *thorn*. The English word for *pencil* is taken over into Urdu and is a school word. *Balloon* would be unfamiliar in the English sense. The word for a toy fire-balloon might serve, but it again might not be equally familiar in villages and cities. Football would probably be known by all schoolboys, but again the word is the English one taken over into the vernacular. *Battleship* is out of the

[1] Cf. Burt, op. cit., p. 39.

question, and while the *automobile* is now sufficiently common, the word for it is *motor*, taken over from the English.

In addition to the four words used above, we have tried as alternatives the following:

Gāṛī—cart or carriage	*Gend*—ball
Bandūq—gun	*Madārī*—juggler

The data upon these words are not yet sufficient to justify offering them as equivalents.

Replies are evaluated according to Terman's schedule of typical definitions.[1]

SCORING. (*a*) Definition *by use.* 4 words—each correct definition, (1); (*b*) Definition *superior to use.* The same 4 words—each correct definition, (2). Maximum score, (8).

Note the (*b*) definitions superior to use include and imply (*a*) definitions by use.

18. Abstract Definitions (S.R. XII 2; B. 60; B.S. XII 4).

PROCEDURE: *Rahm kyā hai? Badla kyā hai? Khairat kyā hai? Hasd kyā hai? Insaf kyā hai?*

ENG. VER.: What is *mercy*? What is *revenge*? What is *charity*? What is *envy*? What is *justice*?

NOTES. The five words of the Stanford Test XII 2 are used. Terman's analysis of typical answers is quite adequate for evaluation and scoring.[2]

A theoretical objection to the words in this list is that four out of the five are of Arabic origin, and only one is from the Sanscrit. The reply is that in Urdu

[1] Cf. Terman, op. cit., p. 222 f. [2] Cf. Terman, op. cit., p. 282.

abstract terms of Arabic derivation are much more frequent than those from any other source, and are quite familiar to Hindus—much more so than are Sanscrit derivatives to Muhammadans.

SCORING. Five items. Each correct definition, (1). Maximum score, (5).

19. Adding Three Two-Anna and Three One-Anna Pieces (S.R. X. AI 2; B. 33; B.S. VIII 4).

PROCEDURE: (Pointing to a one-anna piece,) *Kyā tumheṇ ma'lūm hai ki is kī kyā qīmat hai?*

(And to a two-anna piece,) *Aur is kī kyā qīmat hai? Ab batāo ki in sab kī kyā qīmāt hai!*

ENG. VER.: Do you know what the value of *this* is? And *this*—what is its value? Now tell me, what is the value of *all* of them?

NOTE. The one-anna and two-anna coins are the natural materials for the original Binet test, Age VII, No. 4 (1911). The disadvantages which Terman himself recognises in the Stanford form of the test (i.e., using stamps instead of coins), obtain still more in India than in the U.S.A.

SCORING. Fifteen seconds are allowed. For correct answer, (1). Maximum score, (1).

20. Counting Backward from 20 to 1. (S.R. VIII 2; B. 38; B.S. VIII 2).

PROCEDURE: *Kyā tum ulṭā gin sakte ho? Bīs se ek tak ulṭā gino, bīs . . . unnīs . . .*

ENG. VER.: Tell me, can you count backward? From 20 to 1 count backward, 20 . . . 19 . . .

NOTE. The examiner's intonation of the last two words is sufficient to start the child on the downward path in this test.

SCORING. Time, 40 seconds. For correct response, or response containing only one error, (1); more than one error, (0). Maximum score, (1).

21. Making Change (S.R. IX 3; B. 40; B.S. IX 1).

PROCEDURE: (*a*) *Agar tum tīn āune kī miṭhāī kharīdo, aur dukāndār ko aṭhannī do, to wāpis kyā loge?*

(*b*) *Agar nau āune . . . Bara āune . . .?*

(*c*) *Agar tin āune . . . ek rupaya . . .?*

ENG. VER.: (*a*) If you buy three annas worth of sweets and give the shopkeeper an eight-anna piece, what will you get back?

(*b*) If you buy nine annas worth . . . give twelve annas . . . what . . .?

(*c*) If you buy three annas worth . . . give one rupee . . . what . . .?

NOTE. The test is given as in Terman.[1] Coins are not actually used as in Burt's test.[2] Note that each correct answer receives its separate credit.

SCORING. Three items. Each correct response, (1). Maximum score, (3).

22. N-V. Adaptation Board (P.P. XIV, p. 65).

PROCEDURE: *Ab achchhī tarah dekho. Yih ṭukṛā jo hai, is chhed meṇ nahīṇ jātā. Aur is meṇ nahīṇ jātā. Is meṇ bhī nahīṇ jātā. Is meṇ jātā*

[1] Cf. Terman, op. cit., p. 240.

[2] Cf. Burt, op. cit., p. 49.

hāi! Ab dekho: (1) *Ab kis meṇ jāegā? (Rakho.)* (2) *Ab kis meṇ?* (3) *Ab kis meṇ?* (4) *Ab kis meṇ jāegā?* (5) *Ab kis meṇ?*

ENG. VER.: Now watch carefully. This piece (which I have) will not go into *this* hole. And it will not go into *this* one; nor into *this* one. It goes into *this* one!

Now watch: (1) Now which one will it go into? (Put it in.) (2) Now into which one? (3) Now into which one? (4) Now into which one? (5) Now into which one?

NOTES. This board measures 11 by $8\frac{1}{2}$ inches, and is half an inch thick. There are four round holes in it, three of them being $2\frac{1}{2}$ inches in diameter, and the fourth being $2\frac{7}{16}$ inches. These are placed in the four corners, one inch from the edges of the board. A smooth round block, seven-eighths of an inch in thickness, which exactly fits the largest hole, but will not enter the other three, is used with the board.

The *method* of giving this test is exactly quoted from Pintner and Paterson.[1] "The examiner takes the board in his left hand, and with the right hand holding the block, shows the child that it will fit into the largest hole but *not into any of the other holes*. The board is so held that the large hole is at the examiner's upper right-hand corner. The child is then given the block and the examiner says, 'Put it into the right hole.' If the child fails he is shown how to do it. When this has been done the examiner says, 'Watch closely.' The board is now turned over in such a way that the large hole at the upper right-hand corner

[1] Cf. P.P. op. cit., p. 66.

approaches the child in turning and rests at the examiner's upper left-hand corner. As before, the child is told to put the block in the right place. Again if the child fails he is shown where the right hole now is. The examiner then turns the board over toward the child so that the large hole occupies the position at the examiner's lower left-hand corner. The child reacts as before. The next move is to turn the board so that the large hole occupies the lower right-hand corner. For the last move the examiner holds the board at the top right-hand corner with the right hand, and the bottom left-hand corner with the left, and turns the board toward the child diagonally so that the large hole rests finally at the upper left-hand corner.

" Each move of the board takes about half a second. It is a steady movement and not a hurried procedure."

The number of placements correctly made is recorded. The examiner must exercise constant care that every move of the board is made in full and easy view of the child.

SCORING. Five moves. Each correct placement, (1). Maximum score, (5).

23. N-V. Divided Oblong Card (S.R. V 5; B. 26).

PROCEDURE: *In ṭukṛoṇ ko joṛ do, tāki in kī shakl bilkul is tarah dikhāī de.*

ENG. VER.: Join these pieces together in such a way that their shape will appear just like *this*.

NOTE. Directions as given by Terman.[1] The position of the cards as shown by Burt[2] often seems to lead to accidental success.

[1] Cf. Terman, op. cit., p. 169. [2] Cf. Burt, op. cit., p. 41.

SCORING. For correct placing, (1). Maximum score, (1).

24. Naming Colours (S.R. V 2; B. 17; B.S. VII 3).

PROCEDURE: *Yih rang kyā hai? (Is kā nām kyā hai?) Yih kyā hai? Yih kyā hai? Yih kyā hai?*

ENG. VER.: What colour is this? (What is its name?) What is this? What is this? What is this?

NOTES. For description of the colour card cf. list of materials, § 12. The colours are to be shown in the order—red, yellow, blue, green.

In Urdu the phrase "What colour is this?" does not seem to provoke the irrelevant replies feared by Terman.[1]

Latitude is given in the matter of the actual terms used to denote the colours. Thus:

Red—*lāl, surakh, rattā.*

Yellow—*pīlā, zard, basantī, "khaṭṭā," . . .*

Blue—*nīlā, lilā, āsmānī rāng, . . .*

Green—*harā, sabz, . . .*

Village children especially seem weak on the more technical terms, but respond well with descriptive terms, which are undoubtedly equivalent for the purpose of the test.

SCORING. Four colours. Each correctly named, (1). Maximum score, (4).

25 Giving Differences Between Concrete Objects (S.R. VII 5; B. 34).

PROCEDURE: (*a*) *Lakṛī meṇ aur shīshe meṇ kyā farq hai?*

[1] Cf. Terman, op. cit., p. 164.

(*b*) *Aṇḍe meṇ aur patthar meṇ kyā farq hai?*

(*c*) *Pānī meṇ aur dūdh meṇ kyā farq hai?*

ENG. VER.: (*a*) Between wood and glass what is the difference?

(*b*) Between an egg and a stone what is the difference?

(*c*) Between water and milk what is the difference?

NOTES. The three pairs of concrete objects we have used are, of all that have been suggested, the simplest for the Panjab. Of the objects used in the West in the similar test, *fly* and *butterfly* introduce an unfamiliar word, especially to city children. *Cardboard* at least, if not paper, is unfamiliar to a village child, and even for the city child the English word would have to be used.

Our phrases and the objects to be distinguished are so common that there is no necessity for the extra inducements to reply, permitted by Terman.

SCORING. Three items. Each correct response, (1). Maximum score, (3).

26. Giving Similarities Between Two Objects (S.R. VIII 4: B S. VIII 1).

PROCEDURE: (*a*) *Loha aur chandi ek bāt meṇ āpas meṇ milte haiṇ. Wuh āpas meṇ kis bāt meṇ milte haiṇ?*

(If the child does not respond add) *Lohā aur chāndī kis bāt meṇ ek jāise hote haiṇ?*

(*b*) *Ber aur āmm?* (*c*) *Bail-gāṛi aur ṭāngā?* (*d*) *Lakṛī aur koelā?*

ENG. VER.: (*a*) Iron and silver in one thing are like each other. In what thing are they like each other?

(If necessary add,) Iron and silver, in what thing are they one and the same?

(*b*) Plum and mango? (*c*) Ox-cart and pony-cart? (*d*) Wood and coal?

NOTES. The easiest is placed first. A more familiar pair of fruits than *apple* and *peach* (Stanford) are chosen with a view to meeting the Panjab village child's experience. *Ship* and *motor-car* are omitted for obvious reasons, and two common but different conveyances substituted. *Wood and coal come last*, because of an unexpected difficulty due to the fact that *koelā* is the word for charcoal as well as coal. Charcoal is possibly better known than coal, and its method of production is also familiar. Many children reply to question (*d*), "Coal is made from wood."

The first phrase brings the child's attention at once to something concrete which has to be dealt with. This test and the Rhymes test (No. 30) are good examples of the avoidance of an introductory explanation of what "I *am going* to say," or what "I *am going* to ask you to do."

Terman's examples of satisfactory and unsatisfactory answers are sufficient.[1]

SCORING. Four items. Each correct response, (1). Maximum score, (4).

27. Giving Similarities Between Three Things (S.R. XII 8).

PROCEDURE: *Ab batāo ki yih tīn chīzeṇ āpas meṇ kāise miltī haiṇ?* (*a*) *Sāṇp, gāe, chiṛīyā. Yih*

[1] Cf. Terman, op. cit., p. 219.

tīnoṇ āpas meṇ kāise milī haiṇ? (*b*) *Kitāb, ustād, akẖbār.* (*c*) *U'n, rūī, chamṛā.* (*d*) *Chāqū, pāisā, kīl.* (*e*) *Phūl, ālū, darakẖt.*

ENG. VER.: Now explain how these *three* things are like each other. (*a*) Snake, cow, bird (sparrow). (*b*) Book, teacher, newspaper. (*c*) Wool, cotton, leather. (*d*) Knife, pice (copper coin), nail. (*e*) Flower, potato, tree.

NOTES. In the Stanford test ambiguity was found in two cases. In (*d*) *tār* is the word for telegram as well as for wire. The word *kīl* (nail) has been substituted to avoid this difficulty.

In (*e*) *gulāb* (rose, or rose-bush) seems to have suggested a too great similarity with *tree*, thus throwing *ālū* (potato) into a separate category and spoiling an otherwise satisfactory response. We have therefore substituted *phūl* (flower).

SCORING. Five items. Each correct response, (1). Maximum score, (5).

28. Sentence Building with Three Words; Two or Three Sentences (S.R. IX 5; B. 47, 53, B.S. X 5, XII 2).

PROCEDURE: *Yih to tumheṇ mā'lūm hī hogā ki fiqrā kyā hotā hai. Ab maiṇ tumheṇ tīn lafz detā hūṇ* (*aur*) *tum ek fiqrā banāo jis meṇ yih tīnoṇ lafz ājāeṇ.* (*a*) *Laṛkā, gend, daryā. Ek fiqrā banāo, jis meṇ yih tīnoṇ lafz ājāeṇ.* (If necessary add,) *Yih tīn lafz aur lafzoṇ ke sāth milāo aur is tarah ek fiqra banāo—larka, gend, darya.*

(*b*) *Kam, rupaya, admi.*

(*c*) *Rasta, bazar; bagh.*

ENG. VER.: You must know what a *sentence* is. Now I will give you three words, and you make a sentence in which these three words will be.

(*a*) *Boy, ball, river.* Make a sentence in which these three words will be. (If necessary add,) Join these three words with other words and in this way make a sentence.

(*b*) Work, money, man (men).

(*c*) Road, river, garden.

NOTES. We have had little success in introducing a definition of *fiqrā* as Terman does of the word *sentence*. Such an additional clause seems only to encumber the test with linguistic technicalities. The implicit definition contained in the additional clause, "Join these three words . . ." has proved sufficient.

Desert, rivers, lakes (Stanford) are not suitable for the Panjab. For these we have substituted *road, river, garden.* In (*b*) *ādmī* may be either singular or plural according to the context.

Terman's analysis of satisfactory responses may be used as a guide in determining success or failure in the harder test, i.e., three words in *one* sentence. Ability to make one sentence containing the given words includes and implies the ability to do the same in *two* sentences. This inferior reply is nevertheless worthy of credit. If the child gives two distinct ideas or sentences, as e.g., "The boy has a ball, and he goes to the river," or "The man has to work, and he needs money," he is to be credited with partial success. Wholly unsatisfactory replies, or replies containing three separate ideas or sentences, constitute failure.

All three items are given to each child.

SCORING. Three items. Each correct sentence containing 3 given words, (2); for inferior replies, i.e., if the 3 words are given in two sentences, (1). Maximum score, (6).

29. Ball and Field (S.R. VIII 1, XII 3).

PROCEDURE: *Yih ek khet hai. Yih is ke gird, diwār (bāṛ) hai. Yih darwāzā hai. Tumhārā geṇd is meṇ kho gāyā. Tumheṇ ma'lūm nahīṇ ki kis jagah paṛā hūā hai. Tumheṇ patā nahīṇ ki kis taraf se āyā aur kitne zor meṇ āyā. Tum ko sirf yih ma'lūm hai ki geṇd is khet meṇ kisī na kisī jagah paṛā hūā hai.*

Is meṇ āise rāste kā nishān banāo, jidhar jidhar ko jākar geṇd ḍhūṇḍhoge.

(If the child merely points,) *Nahīṇ pencil se rāstā banāo tākī maiṇ dekh lūṇ.*

(If he is satisfied with an incomplete path,) *Kyā geṇd zarūr mil gāyā? Agar nahīṇ milā to kis taraf jāoge, tāki geṇd zarūr mil jāe?*

ENG. VER.: This is a field. This, around it, is a wall. Here is a gate. Your ball has been lost in this (field). You don't know at what spot it is lying. You don't know which direction it came from or how hard it came. You only know this, that the ball, in this field, in some place or other, is lying.

Make on this the mark of that path, which you will go on (so that) you will surely find it. (If he merely points,) No, make a path with the pencil, so that I can see it.

(If he is satisfied with an incomplete path,) What, are you sure you have found it? (If he indicates that there is any doubt,) If it is not found, which way will you go so that the ball will certainly be found?

NOTES. We have used, instead of a circle, a square figure drawn with one stroke, leaving a gap in the middle of one side. This seems to produce less confusion in the child's mind when the examiner points to one of the straight sides and calls it a *wall*. It has been necessary to specify the *wall* and the *gate*. The field then becomes what would probably be visualised walled garden. *Fields* are not enclosed by fenc walls, and ordinarily a boy would not "know" that ball was in one field and not in the adjacent one.

This is one of the few tests in which we have det evidences of coaching. Teachers who are ambitio their own boys to do well must not be permitt observe the examination.

SCORING. The 30 samples of the Stanford sc card are graded, and the child's drawings are m ked accordingly. Samples 1-5, (5); 6, 8, 10, (4); 7, 9, 12, 13, 18, (3); 11, 14, 15, 16, 17, 19, 20, (2); 21, 22, 23, (1); 24-30, (0). Maximum score, (5).

30. Giving Three Rhymes (S.R. IX 6; B. 54; B.S. XV 2).

PROCEDURE: *Nam, ḳam, dam, sham, kyā yih lafz ek jāisī āwāz dete haiṇ, aur āpas meṇ milte haiṇ, yā nahīṇ?*

(*a*) *Isī tarāh āise lafz bolo jin kī āwāz lafz "āg" se miltī ho, aur āisī āwāz deṇ jāisī kī "āg." Ag . . .*

(*a*) *Jitne ziyādā ādmī ek hī ghoṛe par sawār hoṇ, ghoṛā utnā hī ziyādā dauṛtā hai.*

(*b*) *Kal polīs ne ek laṛkī kī lāsh pāī, jis ke aṭhārā ṭukṛe hūe hūe the. Wuh kahte haiṇ ki us laṛkī ne apne āp ko khud mār liyā hai.*

(*c*) *Kal do rel gāṛīāṇ ek dusre se ṭakrā gāyīṇ, lekin koī bahut nuqsān nahīṇ hūā, sirf aṭhtālīs ādmī mare haiṇ.*

(*d*) *Ek ādmī ghoṛe par sawār thā. Wuh gir paṛā, aur us ke sir meṇ patthar lagā, aur wuh jhaṭ paṭ mar gāyā. Log use hāspatāl meṇ le gāye, aur kahte haiṇ ki us ke bachchne kī ummed nahīṇ hai.*

ENG. VER.: I am going to say a sentence in which there will be some stupidity. You listen carefully and tell me what foolish thing there is in it.

(*a*) The more men there are seated on one same horse, the horse runs just so much the faster.

(*b*) Yesterday the police found the corpse of a girl, of which there were eighteen (separate) pieces. They say that the girl (herself) killed herself.

(*c*) Yesterday two railway trains ran into (collided with) each other. But there was no great damage. Only 48 men were killed.

(*d*) A man was riding on a horse. He fell off, his head struck on a stone, and he died in an instant. They (the people) picked him up and took him to the hospital. It is thought that he will not get well.

NOTES. The first of the Stanford absurdities and Nos. 2 and 5 of Burt's scale are omitted. Children of

the central Panjab will hardly ever have seen a *hilly road*. The idiom in the question of the *three brothers* is uncertain, and the suicide question bids fair to arouse an emotional protest. The four sentences chosen have been modified to suit our subjects' experience. (*a*) becomes horse-back riders instead of cars on a train, and in (*d*) the bicycle rider becomes a horseman. We have changed the railway accident into the more specific *collision*.

The analysis of replies given by Terman supplies analogies to almost all the answers of Panjabi children.[1] If the boy says that the overloaded horse is likely to get frightened and run away, he is given credit. An unexpected but frequent answer to (*b*) is that the police themselves must have been up to their usual tricks and killed the girl. This is only to be scored as correct if the child further elaborates his answer and makes it evident that he has thought it out.

SCORING. Four items. Each correct response, (1). Maximum score, (4).

32. Folded Paper Test (S.R. XIV 2, XVIII 2; B. 61; B.S. AI. 1).

PROCEDURE: (*a*) DRAWING FROM IMAGINATION. *Ab jo kuchh maiṇ karūṇ, achchhī tarah dekho.* (Fold once, twice; tear out a bit on double-fold side.) *Jab maiṇ is ko kholūṇgā to is meṇ kitne surākh* (*chhed*) *nikal āeṇge? Jis jis jagah chhed hogā, is kāgaz par nishān baṇāo.*

(*b*) FINDING THE RULE. *Achchhā, ab dekho.* (Fold once,) *Agar maiṇ is jagah kāṭūṇ, to kitne*

[1] Cf. Terman, op. cit., p. 256.

surākh nikal āeuge? (Fold twice,) *Is jagah, to kitne?* (Three times,) *Is jagah, to kitne?* (Four times,) *Is jagah, to kitne?* (Five times,) *Is jagah, to kitne?*

ENG. VER.: (*a*) Now whatever I do, you watch very carefully. (Fold once, twice; tear.) When I open this how many holes will come out? Wherever there will be a hole, make a mark on this paper.

(*b*) Very well. Now watch. (Fold once,) If I tear it in this place, how many holes will appear? (Twice,) In this place, how many? (Thrice,) In this place, how many? (Four times,) In this place, how many? (Five times,) In this place, how many?

NOTES. This test, as we have given it, is a combination of Binet's paper-cutting test described by Burt[1] and Terman,[2] and of Terman's "Induction Test."[3]

Three oblong sheets of paper, about six inches long by five inches wide, are used. The first part of our test consists in requiring the child to draw at approximately the correct points on one of the plain sheets, the two holes (not regarding shape) which will result from the first tearing. Whether his answer has been right or wrong, the unfolded sheet is shown to him and is then put out of sight.

In the second part of the test a fresh sheet is taken and, without actually tearing out the holes, the mid-points of the folded side of the paper are successively grasped between finger and thumb as if to be torn. In this

[1] Cf. Burt, op. cit., p. 64. [2] Cf. Terman, op. cit., p. 338.
[3] Cf. Terman, op. cit., p. 310.

position the paper is held toward the child so that he can see the various edges and folds, and he is expected to give the answers, 1, 2, 4, 8, 16.

SCORING. (*a*) For *drawing holes* at approximately correct points, (1). (*b*) For *finding the rule*, one point each for the successive responses, 1, 2, 4, 8 and 16. Maximum score, (6).

33. N-V. Healy Form-board (S R. X Al. 3; P.P. VIII, p. 44).

PROCEDURE: *Yih ṭukṛe is meṇ bhar do. Is tarah bhar do ki koī jagah khālī na rahe. Shuru' karo.* (If necessary,) *Zor ke sāth nahīṇ karnā chāhiye. Agar ṭhīk rakhoge to āpḥī ā jāeṇge.*

ENG. VER.: Put (fill) these pieces into *this*, so that there will be no empty space left. Begin. (If necessary,) Don't force them. They will go in of themselves if you place them rightly.

NOTE. In our scale the pieces are to be correctly placed in the frame in 120 seconds or less. It was thought that this time limit for the test might be unduly short, allowing too great credit for accidental successes, and too little for the plodding attack of a boy who might otherwise succeed only once in four minutes, but twice more in the fifth minute. To allow five minutes for the test, however, seemed impossible, in view of the length of the entire examination.

SCORING. For success within 40 seconds, (3); for success in 41 to 80 seconds, (2); for success in 81 to 120 seconds, (1); more than 120 seconds, (0). Maximum score, (3).

34. Problem of the Enclosed Boxes (S.R. XVI 4).

PROCEDURE:

Mere pās ek sandūq hai.

Is ke andar { *do* / *do* / *tīn* / *chār* } *chhoṭe chhoṭe sandūq haiṇ.*

In { *donoṇ* / *donoṇ* / *tīnoṇ* / *chāroṇ* } *meṇ se har ek meṇ* { *ek ek* / *do do* / *tīn tīn* / *char char* }

aur { *chhoṭā* / *chhoṭe chhoṭe* / *chhoṭe chhoṭe* / *chhoṭe chhoṭe* } *sandūq haiṇ*

Kull kitne sandūq haiṇ?

(If necessary add,) *Pahle, baṛā sandūq; phir do (tīn, chār) us se chhoṭe chhoṭe; aur un donoṇ (tīnoṇ, chāroṇ) meṇ ek ek (2 2, 3 3, 4 4) un se bhī chhoṭā (chhoṭe chhoṭe).*

ENG. VER.: I have a box. Inside it are two little boxes. In each one of these two is one wee wee box. Altogether how many boxes are there? (If necessary,) First the *big* box; then two smaller than it, inside; and in those two, one each, still smaller than they are. (And similarly for 2, 3, 4.)

NOTE. No actual boxes are shown. Otherwise the procedure is as in Terman.[1] The oral quality of the test as given is beautifully imitative of the diminishing sizes of the boxes.

[1] Cf. Terman, op. cit., p. 327.

SCORING. Four items. Each correct response, (1). Maximum score, (4).

35. Rajah and Deputy Commissioner (Collector) (S.R. XIV 3; B. 65; B.S. Ad. 3).

PROCEDURE: *Rājā meṇ aur Diptī Kamishnar meṇ kyā farq hotā hai? Aur kyā farq? Aur kyā farq?*

ENG. VER.: What is the difference between a Rajah and a Deputy Commissioner (British Indian official, at the head of a Panjab district)?

What other difference? What other difference?

NOTES. This test seems to be as nearly analogous to the President-King test as any that could be devised.[1]

For other provinces than the Panjab, "Collector" may be used instead of Deputy Commissioner.

SCORING. Three differences. Each correct difference given, (1). Maximum score, (3).

§ (7) Seven Additional Tests

There are seven additional tests indicated on the scoring sheet. These all seem to be useful tests, but have not as yet been given sufficient trial to warrant their being included in the scale. It is hoped that data secured from the use of the tests will be available for further standardization, and for insertion later in a revised and extended scale. The procedure for these tests, both Urdu and Panjabi, is as follows.

A 1. Naming Knife, Pen and Key (S.R. III 2).

HINDUSTANI: *Yih kyā hai?* (*a*) *Kunjī* (*chābī*). (*b*) *Pāisā.* (*c*) *Chāqū.* (*d*) *Qalam.*

[1] Cf. Terman, op. cit., p. 313.

ENG. VER.: What is this? (*a*) Key. (*b*) Pice. (*c*) Knife. (*d*) Pen.

PANJABI: *Ih kī ai?* (*a*) *Chābī.* (*b*) *Pāisā.* (*c*) *Chāqū* (*d*) *Qalam.*

A 2. Repeating Seven Syllables (S.R. III 6).

HINDUSTANI: *Mere pīchchhe bolo:* (*a*) *Kutte ne billī pakṛī.* (*b*) *Billī ne chūhā mārā.* (*c*) *Garm hawā chaltī hai.*

ENG. VER.: Say after me: (*a*) (The) dog caught (the) cat. (*b*) (The) cat killed (a) rat. (*c*) (A) warm breeze is blowing.

PANJABI: *Mere pīchchhe bolo:* (*a*) *Kutte ne billī phaṛī.* (*b*) *Billī ne chūhā mārīyā.* (*c*) *Garm hawā chaldī ai.*

A 3. Longer Lines (S.R. IV 1).

HINDUSTANI: (*a*) *In donoṇ* (*lakīroṇ*) *meṇ se kaunsī lambī hai?* (*b*) *Ab kaunsī lambī hai?* (*c*) *Ab kaunsī lambī hai?*

ENG. VER.: (*a*) Of these two lines, which is the long one? (*b*) *Now* which is the long one? (*c*) *Now* which is the long one?

PANJABI: *Ehnāṇ doāṇ* (*lakīrāṇ*) *wichchoṇ kehṛī lammī ai?* (*b*) *Hun kehṛī lammī ai?* (*c*) *Hun kehṛī lammī ai?*

A 4. Triple Order (S.R. V 6).

HINDUSTANI: *Suno, ek kām mere liye karo. Pahle yih kunjī us kursī par rakho. Phir wuh dar-*

wāzā kholo (or *band karo*). *Aur phir wuh sandūq* (or *kitāb*) *mere pās le āo. Samajh gāye? Pahle kunji kursī par rakho; phir darwaza kholo; aur phir sanduq le āo. Shurū' karo.*

ENG. VER.: Listen, do something for me. First put this key on that chair. Then open (or shut) that door. And then bring that box (or book) to me. Do you understand? First put the *key* on the chair; then open the *door*; and then bring the *box*. Begin.

PANJABI: *Suṇ, sāḍe laī ik kam kar. Pahlāṇ ih kunjī os kursī utte rakh. Phir oh darwājā khol. Te phir oh sandūq* (or *kītāb*) *mere kol lai ā.*

A 5. Counting Thirteen Pice (S.R. VI 3).

HINDUSTANI: *Yih pāise dekho. In ko gino. Kitne haiṇ?* (If necessary add,) *Apnī uṇglī se is tarah gino. Ek . . .*

ENG. VER.: Look at these pice. Count them. How many are there? (Add,) Count them with your finger like this. One . . .

PANJABI: *Eh pāise wekh. Ehnāṇ nūṇ gin. Kinne ne?* (Add,) *Apnī uṇgli de nāl is tarāṇ gin. Ik . . .*

A 6. Clock Puzzle (S.R. XIV 6).

HINDUSTANI: *Kyā tum ghaṛī se waqt batā sakte ho? Farz karo ki chhe baj kar bāīs miniṭ hūe haiṇ, ghaṛī kī baṛī sūī kis jagah hogī, aur chhoṭī sūī kis jagah hogī? Achchhā. Ab farz karo ki*

ghaṛī kī baṛī sūī chhoṭī sūī kī jagah par ā jāe, aur chhoṭī sūī baṛī sūī kī jagah par, to waqt kyā hogā?

Farz karo ki āṭh baj kar das miniṭ hūe haiṇ. (If the hands change places,) *ghaṛī kī baṛī sūī kis jagah hogi, aur chhoṭī sūī kis jagah hogī?*

Farz karo ki tin bajne meṇ chaudah miniṭ (bāqī) haiṇ, ghaṛī kī baṛī sūī kis jagah hogī, aur chhoṭī sūī kis jagah hogī?

ENG. VER.: Can you tell time by the clock? Suppose that twenty-two minutes after six o'clock have gone by. Where will the big "needle" of the clock be, and where will the little "needle" be? Good! Now suppose that the big hand should come in the little hand's place, and the little hand in the big hand's place, what time will it be?

Suppose that ten minutes after eight o'clock have gone by, (now with reversed positions,) where will the big hand of the clock be, and where will the little hand be?

Suppose that there remain fourteen minutes to three o'clock, (with reversed positions,) where will the big hand of the clock be, and where will the little hand be?

PANJABI: *Tūṇ ghaṛī thoṇ waqat das sakdāeṇ? Faraz kar ki chhe waj ke bāī miniṭ hoe ne. Ghaṛī dī waḍḍī sūī kis jagah hoegī, te chhoṭī sūī kis jagah hoegī? Changā! Huṇ faraz kar ki waḍḍī sūī chhoṭī sūī dī jagah te ā gaī ai, te chhoṭī sūī waḍḍī sūī dī jagah te ā gaī ai, tāṇ waqat kī hoega?*

Faraz kar ki 8 waj ke 10 miniṭ hoe ne, ghaṛī dī waḍḍī sūī kis jagah hoegī te chhoṭī sūī kis jagah hoegī?

Faraz kar ki 3 wajan wichch 14 miniṭ rahṇde ne, ghaṛī dī waḍḍī sūī kis jagah hoegī, te chhoṭī sūī kis jagah hoegī?

A7. Ingenuity Test (S.R. Sup. Ad. 6).

HINDUSTANI: (*a*) *Ek bartan meṇ tīn ser dūdh ātā hai, aur dūsre meṇ pānch ser ātā hai. In do bartanoṇ ko leke kis tarah sāt ser dūdh nāp kar lāoge?*

(*b*) (In similar phrase,) How would you measure out 8 sers in a 5-ser and a 7-ser vessel?

(*c*) (Similarly,) 7 sers in a 4-ser and a 9-ser vessel?

ENG. VER.: In one vessel 3 sers (quarts) of milk (will) go, and in a second, 5 sers will go. With these two vessels how will you measure out and bring back 7 sers of milk? Etc., etc.

PANJABI: *Ik bartan wichch tin ser dūdh paindā ai. Duje wichch panj ser paindā ai. Ehnāṇ do bartanāṇ de nāl satt ser dūdh kis tarāṇ lai āweṇgā? Etc., etc.*

§ (8) Panjabi Equivalents

The problem of vernacular tests in the Panjab is complicated by the existence of a household speech or dialect considerably different from the pure "Urdu" of the schools. The relation of the Panjabi dialect to the Hindustani (Urdu) can best be characterized for our

purpose here by making a comparison with the Negro dialect in the U.S.A., and its relation to ordinary English. If the Negro dialect were reduced to rule, given its own inflectional endings for all declensions and conjugations, permitted to employ without apology many homely terms and energy-saving elisions, various vowel and consonant substitutions being introduced, such as *d* for *th*, etc., we should have a dialect of English very closely analogous to the Panjabi dialect of Hindustani. The grammatical structure is identical and the vocabulary is very largely identical (almost wholly so as far as the language of our tests is concerned), the chief difference being one of inflection and pronunciation.

Children in school up to the age of nine or ten, and especially village children, are much more familiar with the homely speech. Their teachers use it in the class-room and only gradually is it replaced by the more elegant Urdu.[1]

In our scale the Panjabi form is made alternative. In justification of this procedure, the tests may be divided into three classes and considered separately.

1. In all tests which can be regarded as "performance tests" in the strict sense of the term, this procedure would hardly require defence. These tests are as follows:

No.	No.
1. Knox Cubes.	12. Copying a Diamond.
3. Goddard Form-board.	22. Adaptation Board.
10. Two Designs.	23. Oblong Card.
11. Copying a Square.	33. Healy Form-board.

[1] This account does not take cognizance of the movement among the Sikhs in the central Panjab to make Panjabi their "national" speech. In their own schools they employ Panjabi throughout, making use of the "Gurmukhi" script, and elevating the dialect to the status of a literary language by introducing a larger element of Sanscrit into their vocabulary.

2. In the following list of tests the language is *identical*, as may be seen by comparing the two versions phrase by phrase and word by word. There is no change other than that of particles, prepositions, pronouns, inflectional endings and the pronunciation of words.

No.		No.	
4.	Digits Forward.	23.	Oblong Card.
5.	Digits Backward.	24.	Colours.
6.	Syllables.	25.	Differences.
8.	Questions (except *b* and *e*).	27.	Three Similarities (3).
16.	Coins.	28.	Three Words in One or Two Sentences.
17.	Concrete Definitions.		
18.	Abstract Definitions.	30.	Rhymes.
20.	Counting Backward.	32.	Paper Test.
22.	Adaptation Board.	34.	Boxes.

35. Raja and D.C.

3. In the remaining tests the equivalence may not be so obvious to a reader unfamiliar with the languages in question. Local vernacular terms which would not be understood by Urdu-speaking people outside of the Panjab, but which are used by Panjabis as exact synonyms, are introduced. In the following list all the synonymous terms thus used are enumerated.

Test No.	Urdu Original	English Equivalent	Panjabi Word Introduced	No. of Synonyms	Name of Test
2	*mil*	find	*labh*	3	Weights
	halkā	light	*haulā*		
	bojh	weight	*bhār*		
7	*achchhī*	good	*changī*	2	Pictures
	batāo	explain	*das*		
8	*sardī*	cold	*pālā*	2	Questions (*b*, *e*)
	waqt	time	*welā*		
9	*jaldī*	fast	*chhetī*	2	Words in 2 Mins.
	jānā	go	*chalnā*		

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9	*jaldī*	fast	*chhetī*	2	Words in 2 Mins.
	jānā	go	*chalnā*		

Test No.	Urdu Original	English Equivalent	Panjabi Word Introduced	No. of Synonyms	Name of test
10	*waqt*	time	*chir*	2	Two Designs
	chhipā	hide	*lukā*		
13	*khūbsūrat*	beautiful	*sohnī*	1	Prettier Faces
14	*kam*	lacking	*ghaṭ*	1	Missing Features
15	*dahnī*	right	*sajjī*	2	Fingers
	bain	left	*khabbī*		
19	*ma'lūm*	knowledge	*paṭā*	2	Adding
	qīmat	price	*mull*		
21	*dukāndār*	shopkeeper	*haṭwāī*	1	Change
26	*bāt*	thing	*gal*	1	Similarities
29	*kho*	lost	*gawāch*	4	Ball and Field
	khet	field	*paīlī*		
	ma'lūm	knowledge	*paṭā*		
	mil	find	*labh*		
31	*achchhā*	good	*changā*	8	Absurdities
	batāo	explain	*das*		
	sawār	seated	*charan*		
	bhāg	run	*bhajj*		
	larkī	girl	*kuṛī*		
	ṭakrā	collide	*bher*		
	gir	fall	*digg*		
	uṭhā	lift	*chukk*		

In all only 27 different new words are introduced in the entire Panjabi scale.

Examples of the Alternative Urdu and Panjabi Forms

We may here show in parallel lines examples of the three classes of tests as above described.

1. NON-VERBAL. EXAMPLE, TEST 23. OBLONG CARD.

U[1]: *In do ṭukṛoṇ (ko) is tarah joṛ*
P[2]: *Inhāṇ doāṇ ṭukṛīyāṇ (nūṇ) tūṇ ("you") is tarāṇ joṛ*
U: *do ki in kī shakl bilkull is tarah dikhāī*
P: *de tāṇ jo inhāṇ dī shakal bilkull is tarāṇ wikhāī*
U: *de.*
P: *dewe.*

2. IDENTICAL. EXAMPLE, TEST 8. A, B, C, QUESTIONS.

U: *Jab tumheṇ nīnd āe, to tum ko kyā karnā*
P: *Jad tainūṇ niṇdar āwe, tāṇ tainūṇ kī karnā*
U: *chāhīye? Jab tum ko sardī lage, to*
P: *chāhīdā (ai)? Jad tainūṇ pālā lagge, tāṇ*
U: *tum ko kyā karnā chāhīye? Jab tum ko bhūk*
P: *tainūṇ kī karnā chāhīdā ai? Jad tainūṇ bhukh*
U: *lage. . . .*
P: *lagge. . . .*

3. WITH PANJABI SYNONYMS. EXAMPLE, TEST 7. PICTURES.

U: *Is taswīr ko gaur se dekho aur is kī*
P: *Es taswīr (mūrat) nūṇ chaṇgī tarāṇ wekh, te eh dī*
U: *bābat sab kuchh batāo.*
P: *bābat sab kuchh das.*

Examples may be multiplied by comparing the Urdu tests and their literal English translation with the Panjabi equivalents as given in the complete scale below.

Summary of Reasons for the Bi-lingual Scale

1. The people of the Panjab are all bi-lingual.

[1] U. indicates Urdu. [2] P. indicates Panjabi.

Two vernaculars exist side by side, one remaining the household speech and the other only gradually replacing it.

2. These vernaculars are grammatically identical, and in vocabulary and usage shade into each other in infinite degree.

3. The Panjabi speech is the local dialect and possesses many varieties roughly coincident with the geographical and communal divisions of the province.

4. The Urdu is a general speech, the *lingua franca* of India, not confined to this province, but current in a large part of the peninsula, especially where there is a Muhammadan population, or has ever been Muhammadan rule. In the Panjab slightly more than half of the population is Muhammadan.

5. The tests could not be put into Panjabi in the first instance, as the variance between its local forms would lead to the discredit of any particular version, and to looseness in its use.

6. Insistence upon the Urdu form would be impossible in the case of all village children and of younger children even in cities.

7. Only three tests in the entire scale are vitiated by a repetition of the exact words of the formula. These three are Nos. 4, 5, and 6, Repeating Digits, and Repeating Syllables. In these three, also, the *instructions*, but not the portion for reproduction, may be repeated if necessary. This being the case, we feel that when a child does not reply at once to a question as couched in Urdu, it is legitimate to repeat the *same formula* in the standard phrasing in whichever of the two versions it has already been discovered that he is the more at home. This is to put on a common footing the child for whom the Urdu formula has been repeated,

the child for whom the Panjabi formula has been repeated, and the child for whom one formula has been elucidated by repetition in alternative form, it being remembered that all our children are bi-lingual, and that all our alternative tests are held to be *equivalent*.

It may be said that control tests should at once be devised to demonstrate this assumed equivalence. It seems to the writer that this will be feasible only when we have a highly satisfactory Performance scale with age-norms established, against which the scores of selected groups of our Hindustani and Panjabi subjects can be thrown for comparison. Until such time we shall have to accept them as equivalent.

Panjabi Equivalents. Procedure Alternative to the Urdu Tests

1. N-V. Knox Cubes: *Changī tarāṇ wekh, te jis tarāṇ maiṇ karāṇgā, tūṇ wī ose tarāṇ kar* (*karīṇ*).

2. N-V. Weights: (*1*) (*a*) *Enhāṇ doāṇ ḍabbīāṇ wichchoṇ bhārī kehṛī ai?* (*b*) *Enhāṇ doāṇ wichchoṇ?* (*c*) *Enhāṇ wichchoṇ?*

   (*2*) *Eh ḍabbīāṇ jihṛīāṇ haiṇ, ikko jiheāṇ wikhāī deudīāṇ haiṇ ke nahīṇ? Āho, par ikko jihīāṇ nahīṇ. Har ikk de bhār wichch faraq ai.*

   Huṇ sārīāṇ nāloṇ bhārī itthe rakh, te us thoṇ haulī itthe, te ṣārīāṇ nāloṇ haulī itthe. (*Sārīāṇ nāloṇ bhārī itthe, te sārīāṇ nāloṇ haulī itthe.*)

3. N-V. Goddard Form-Board: *Inhāṇ ṭukṛīyāṇ nūṇ ilnāṇ dī apnī apnī jagah wichch bharnā ai. Wekhāṇ tūṇ kinnī jaldī nāl rakh sakdā haiṇ.* (*Is tarāṇ rakh, tāṇ jo har ikk apnī apnī ṭhīk jagah wichh ā jāe.*)

Pher rakh, chhetī chhetī kar.
Pher rakh, chhetī rakh.

4. Repeating Digits Forward: *Jo kuchh maiṇ akhāṇ (bolāṇ) tūṇ mere pichchhe bol (ākh). Pahlāṇ chaṇgī tarāṇ suṇ, te pher mere pichche bol (ākh).*
(*Ikk do tiṇn chār panj chhe satt aṭṭh nau das.*)

5. Repeating Digits Backward: *Huṇ mere pichchhe bol, par ulṭā karke bol. Je maiṇ bolāṇ "tiṇn, satt"— tūṇ bol, "satt, tiṇn."* (If necessary), *Je maiṇ bolāṇ* "6, 4," *tūṇ kī bolṇgā? . . .* "4, 6."

6. Repeating Syllables: *Jo kuchh maiṇ bolāṇ tāṇ mere pichchhe bol. Chaṇgī tarāṇ suṇ.* (Sentences in *Urdu* without change.)

7. Description and Interpretation of Pictures: *Es taswīr nūṇ chaṇgī tarāṇ wekh, te eh dī bābat sab kuchh das.*

8. Questions: (*a*) *Jad tainūṇ nīnd lagge, tāṇ tainūṇ kī karnā chāhīdā ai?*
(*b*) *Jad tainūṇ pālā lagge, tāṇ tainūṇ kī karnā chāhīdā ai?*
(*c*) *Jad tainūṇ bhukh lagge, tāṇ . . . ?*
(*d*) *Je tere koloṇ kise dī koī chīj ṭuṭ jāwe, tāṇ tainūṇ kī karnā chāhīdā ai?*
(*e*) *Je school jāṇ wele rāh wichch der lagan dā ḍar howe, tāṇ kī karnā chāhīdā ai?*
(*f*) *Je tere sāthī koloṇ tainūṇ satt lag jāe, tāṇ tainūṇ kī karnā chāhīdā ai?* (If necessary), *Terā sāthī tainūṇ māre, par jān būjh ke na māre.*
(*g*) *Jad (je) tainūṇ koī us ādmī dī bābat kuchh puchchhe*

jihnūṇ tūṇ changī tarāṇ nahīṇ jāndā, tāṇ tainūṇ kī kahnā chāhīdā ai?

(*h*) *Jad tūṇ kise zarūrī kamm nūṇ shuru' karan laggeṇ tāṇ tainūṇ kī karnā chāhīdā ai?*

(*i*) *Kī sabab ai, ke sānūṇ kise bande dī pachhān uh dīāṇ gallāṇ thoṇ nahīṇ par oh dīāṇ kammāṇ thoṇ karnī chāhīdā ai?*

9. Words in Two Minutes: *Tūṇ do miniṭ wichch kinne lafaz bol sakdā aiṇ. Jinne lafaz tainūṇ āunde hain chhetī chhetī boldā jā. Maiṇ ginnāṇgā. Jihṛe lafaz chāhuṇdā aiṇ, bol, jis ṭarāṇ, "baddal, mej, sabaz, kuttā, khush." Bol.*

10. N-V. Drawing Two Designs: *Huṅ niaiṇ tainūṇ do shakalāṇ wikhāwāṇgā. Bahut thoṛe chir lai wikhāwāṇgā, te pher (ohnāṇ nūṇ) chhipā (lukā) lawāṇgā. Tūṇ (changī tarāṇ) wekh lai, te pher is jagah khichch.*

Huṅ wekh. Wekhdā raho. Dowāṇ nūṇ wekh. Huṅ is jagah khichch lai.

11. N-V. Copying a Square: *Is shakal nūṇ wekh. Huṅ tūṇ aise tarāṇ dī ikk shakal banā. Is jagah khichch.*

12. N-V. Copying a Diamond: *Huṅ ehdī naql kar. Is jagah aise tarāṇ dī ikk shakal khichch.*

13. Choosing Prettier Faces: *Ehnāṇ doāṇ taswīrāṇ nūṇ wekh. Inhāṇ wichchoṇ kehṛī sohṇī (khūbsūrat) ai?*

14. Recognizing Missing Features: *Is taswīr wichch koī nuqs ai? Koī chīj ghaṭ ai? Mūṇh dā kihṛā hissā ghaṭ ai?*

15. Giving Number of Fingers: *Tere sajje hath dīāṇ*

kinnīāṇ unglāṇ hain? Khabbe hath dīāṇ kinnīāṇ? Doāṇ lathāṇ dīāṇ kinnīāṇ hain?

16. Naming Six Coins: *Ih kī hai?* (*Rupayā, aṭhannī, chauannī, dauannī, ānnā, paisā.*)

17. Concrete Definitions: *Sher kī chīj hai? Sipahi kī (chīj) hai? Ālū kī (chīj) hai? Haṭṭī kī (chīj) hai?*

18. Abstract Definitions: *Rahm kī hai? Badlā kī ai? Khairāt kī ai? Hasad kī ai? Insāf kī ai?*

19. Adding Three One-Anna and Three Two-Anna Pieces: *Eh tāṇ tainūṇ patā ai, ihdī kī qīmat (mull) ai? Te ihdī kī qīmat ai? Huṅ das ehnāṇ sārīāṇ dī kī qīmat ai?*

20. Counting Backward from 20 to 1: *Kī, tūṇ ulṭā gin sakdā (hain)? Vīh (āṇ) thoṇ laike ikk tīkar ulṭā gin. Jis tarāṇ, "wīh . . . unnīh."*

21. Making Change: *Je tūṇ tinn ānne dī miṭhāī kharīdeṇ te halwāī nūṇ aṭhannī dewen (uh de koloṇ) wāpas kī lāeṇgā? Je nau ānne . . . bārāṇ ānne . . . kī . . . ? Je tinn ānne . . . ikk rupayā . . . kī . . . ?*

22. N-V. Adaptation Board: *Huṅ changī tarāṇ wekh. Ih ṭukṛā jikṛā ai, is chhek wichch nahīṇ paindā. Te is wichch wī nahīṇ paindā. Is wichch wī nahīṇ paindā. Is wichch pai jandā ai. Huṅ wekh:— Huṅ kih de wichch jāwegā?* (*Rakh.*) *Huṅ kih de wichch? etc., etc.*

23. N-V. Divided Oblong Card: *Inhāṇ doāṇ ṭukṛīyāṇ (nūṇ) tūṇ* (you) *is tarāṇ joṛ de, tāṇ jo inhāṇ dī shakal bilkull is tarāṇ wikhāī dewe.*

24. Naming Colours: *Eh rang kī ai?* (*Ehdā nāṇ kī ai?*) *Eh kī ai? Eh kī ai? Eh kī ai?*

25. Giving Differences Between Concrete Objects: *Lakṛi* (*lakkaṛ*) *wichch te shishe wichch kī faraq hondā ai? Patthar wichch te ande wichch kī faraq hondā ai? Dudhh wichch te pani wichch kī faraq hondā ai?*

26. Giving Similarities Between Two Objects: (*a*) *Lohā te chāndī ikk gal wichch ikk dūje nāl milde han. Oh ikk dūje nāl kehṛī gal wichch milde han?* (*Lohā te chāndī kehṛī gal wichch ikko jihe honde han?* (*b*) *Ber te amb.* (*c*) *Gaḍḍā te ṭāngā.* (*d*) *Lakkaṛ te kolā.*

27. Giving Similarities Between Three Things: *Huṅ das ki ih tinn chīzāṇ āpo wichch ikk dūje nāl kis tarāṇ mildīāṇ ne—*

Gāṇ chiṛī te sapp.
Kitāb ustād te akhbār.
Unn rūṇ te chamṛā (*chamm*).
Chāqū paisā te kil.
Phull ālū te darakht.

28. Sentence Building with Three Words: *Tainūṇ patā howegā ki fiqrā kī hondā ai. Huṅ maiṇ tainūṇ tinn lafaz deṇdā hāṇ. Tūṇ ikk fiqrā banā jehde wichch eh tinnoṇ lafaz ā jān.*

(*a*) *Laṛkā, geṇd, daryā. Ikk fiqrā banā jehde wichch eh tinn lafaz hon.* (If necessary), *Eh tinn lafaz hor lafazāṇ de nāl milā, te is tarāṇ ikk fiqrā banā—laṛkā, geṇd, daryā.*

(*b*) *Kām, rupayā, ādmī.*

(*c*) *Rastā, bāzār, bāgh.*

29. Ball and Field: *Wekho eh ikk khet ai. Te ih, ih de chāroṇ pāse, wāṛ ai; eh ikk darwajā ai. Terā geṇd is wichch gawāch gayā hoegā. Tainūṇ patā nahiṇ ke kitthe piā ai, yā kidaron āyā, te kinne zor wichch āyā ai. Tainūṇ bas ainā patā ai ke geṇd is pailī de andar ai.*

Tūṇ os nūṇ labhnā ai. Jidhar jidhar jāke labheṇgā udhar rāh dā i jihā nishān banā pai tainūṇ geṇd zarūr labh pāe.

Nahiṇ, pinsal nāl rāh dā nishān banā, tāṇ jo maiṇ wekhāṇ.

Kī, geṇd jarūr labh piā ai? Je nahiṇ labhiyā, tāṇ kehṛī taraf jaweṇgā, tāṇ jo geṇd jarūr labh pāwe?

30. Giving Three Rhymes: *Nām, kām, dām, shām—eh lafaz ikko jihī awāz deṇde neṇ, te āpo wichch milde neṇ ki nahiṇ?*

(*a*) *Ise tarāṇ oh lafaz bol jihnāṇ dī awāz lafaz "āg" nāl mile; ajahī awāz deṇ jis tarāṇ "āg" . . . Āg. . .*

(*b*) *Huṇ ajahe lafaz bol jihnāṇ di awāz lafaz "kab" nāl mile—kab. . . .*

31. Detecting Absurdities: *Maiṇ ikk gal karāṇgā jih de wichch kuchh bewaqūfī hai. Tūṇ changī tarāṇ suṇ, te das jihṛī is wichch bewaqūfī dī kī gal hai?*

(*a*) *Jinne ziyādā (bahutā) ādmī ikko ghoṛe utte chaṛan ghoṛā unnāī ziyādā (bahutā) dauṛdā (bhajdā) ai.*

(*b*) *Kal pulas ne ikk laṛkī (kuṛī) dī lāsh labbhī jehde aṭhārāṇ ṭoṭe sān (hoe hoe si). Oh kalmde ne ke kuṛī ne apne āp nūṇ āpe mār liyā ai.*

(*c*) *Kal do rel gaḍḍīāṇ āpo wichch ṭakrā gaīāṇ (bhiṛ*

paiāṇ) par koī bahutā nuqsān nahīṇ hoiā. Sirf aṭhtālī ādmī mare neṇ.

(*d*) *Ikk laṛkā ghoṛe te chaṛiā hoiā sī; uh digg piā; uh de sir wichch patthar lagiā, te uh jhaṭ paṭ mar gayā. Lok ohnūṇ chukk ke hāspatāl lai gaye, te kahnde han ki uh de bachan dī koī ziyādā ummed nahīṇ.*

32. Folded Paper Test: (*a*) *Huṇ jo kujh maiṇ karāṇgā chaṇgī tarāṇ wekh.* (Fold once, twice, tear out a bit on double-fold side.) *Jadoṇ maiṇ is nūṇ kholāṇgā tāṇ ihde wichch kinne chhek nikalange (wikhāī denge)? Jithe jithe chhek howegā, us jagah te nishān banā.*

(*b*) *Chaṇgā. Huṇ wekh.* (Fold once.) *Je maiṇ aithoṇ (is jagah thoṇ) kaṭ dewāṇ (kāṭān), tāṇ kinne chhek nikalange (wikhāī denge)?*

33. N-V. Healy Form-board: *Ehnāṇ ṭukṛcāṇ nūṇ ih de wichch bhar de. Es tarāṇ bhar de ki koī jagah khālī na rahe.* (If necessary), *Zor lagān dī loṛ nahīṇ. Je ṭhīk rakheṇgā tāṇ āpe ī ā jānge.*

34. Problem of the Enclosed Boxes: *Mere kol ikk sandūq ai; uh de wichch do* (subsequently *do, tinn, chār*), *chhoṭe sandūq han. Ohnāṇ doāṇ (doāṇ, tinnāṇ, chārāṇ), wichchoṇ har ikk wichch ikk ikk (do do, tinn tinn, chār chār), chhoṭā chhoṭā (nikkā nikkā), sandūq ai. Kull (sāre) sandūq kinne hoe?*

35. Rajah and Deputy Commissioner (Collector): *Rājā te Diptī Kamishnar wichch kī faraq houdā ai? Hor kī faraq? Hor kī faraq?*

§ (9) Point Scale Norms and Mental Ages[1]

In the Table of Point Scale Norms and Mental Ages which follows (Table I), there are three series of figures:

(*a*) Serial numbers from 10 to 139, which are total scores out of a maximum of 170;

(*b*) Corresponding to these respective scores, figures indicating mental age in months; and

(*c*) Roman numerals indicating complete years of mental age, placed for convenient reference opposite the equivalent number of months, i.e. 48, 60, 72 months, etc.

In the calculation of "Hindustani Intelligence Quotients" or ratios, the method is simply to divide mental age in months by chronological age (i.e. actual age) in months. This quotient should be carried to two decimal places at least, or to three if desired. The use of a slide-rule greatly facilitates the computation if a large number of cases are to be scored.

To take an example: A boy of 6 years and 9 months of age makes a total point scale score of 55. His mental age is read from the table, second column, opposite the number 55, viz., 87 months. His actual age is 81 months. His Hindustani Intelligence Quotient is 87/81 or 1.073. This may be written 1.07, or, more simply, 107.

[1] The provisional norms published on the basis of the first 929 cases, and used in the original study of test results are reported in Part II, p. 114. The norms here given have been corrected by the inclusion of 459 cases subsequently examined and reported.

TABLE I

Point Scale Norms and Mental Ages (1,388 Cases)

Points	M.A.	Points	M.A.	Points	M.A.
10	53	54	87	93	132 XI
11	54	55	87	99	133
12	55	56	88		
13	55	57	89	100	135
14	56	58	90	101	136
15	56	59	91	102	138
16	57			103	139
17	58	60	92	104	141
18	59	61	93	105	142
19	59	62	94	106	144 XII
		63	95	107	146
20	60 V	64	96 VIII	108	147
21	61	65	97	109	149
22	61	66	98		
23	62	67	99	110	150
24	62	68	100	111	152
25	63	69	100	112	153
26	64			113	155
27	65	70	101	114	157 XIII. 1
28	65	71	102	115	159
29	66	72	103	116	161
		73	104	117	163
30	67	74	105	118	166
31	68	75	106	119	168 XIV
32	69	76	107		
33	70	77	108 IX	120	170
34	70	78	108	121	172
35	71	79	109	122	174
36	71			123	176
37	72 VI	80	110	124	178
38	73	81	111	125	180 XV
39	74	82	112	126	183
		83	113	127	185
40	75	84	114	128	188
41	76	85	115	129	191
42	76	86	116		
43	77	87	117	130	193 XVI. 1
44	78	88	118	131	196
45	79	89	120 X	132	198
46	80			133	202
47	81	90	121	134	206 XVII. 2
48	82	91	122	135	210
49	83	92	123	136	213
		93	124	137	216 XVIII
50	83	94	126	138	220
51	84 VII	95	127	139	224
52	85	96	129		
53	86	97	130		

§ (10) Brief Scale Norms

The following Table of Brief Scale Norms is constructed in the same way as Table I above. Complete rules for the use of the Brief Scale are given below. It is to be noted that Brief Scale scores alone do not sufficiently differentiate mental ages above XIII.

TABLE II

BRIEF SCALE NORMS AND MENTAL AGES (1,388 CASES)

POINTS	M.A. MOS. YRS.	POINTS	M.A. MOS. YRS.	POINTS	M.A. MOS. YRS.
5	48 IV	23	84 VII	41	120 X
6	50	24	86	42	122
7	52	25	88	43	124
8	54	26	90	44	126
9	56	27	92	45	130
10	58	28	94	46	134 XI. 2
11	60 V	29	96 VIII		
12	62	30	98	47	138
13	64	31	100	48	142
14	66	32	102	49	146 XII. 2
15	68	33	104	50	150
16	70	34	106	51	156 XIII
17	72 VI	35	108 IX	52	162
18	74	36	110	53	174 XIV. 6
19	76	37	112		
20	78	38	114	54	186 XV. 6
21	80	39	116		
22	82	40	118	55	198 XVI. 6

§ (11) Rules for the Use of the Brief Scale, and for the Omission of Later Tests

1. The Brief Scale may be used in special cases if time does not permit giving the complete examination, or if provisional scores are required for a particular purpose. The relationship found to exist between Brief Scale scores and point scores is set forth in Part II, § § 28, 29.

2. The ten tests of the Brief Scale comprise the

first part of every complete examination, and none of them may be omitted.

3. In continuing the examination, the following *six tests* may not be omitted under any circumstances:

(*a*) Test No. 14—Missing Features.
(*b*) „ 17—Concrete Definitions.
(*c*) „ 25—Concrete Differences.
(*d*) „ 26—Similarities between Two Things.
(*e*) „ 29—Ball and Field.
(*f*) „ 32—Paper Test.

4. The total number of points scored on the ten tests of the Brief Scale may be noted. If the Brief Scale score is less than *14*, the following *four tests* may be omitted, and may be assigned a score of *nil* "by implication":

(*a*) Test No. 28—*Three Words in One or Two Sentences.*
(*b*) „ 30—Rhymes.
(*c*) „ 33—Healy Form-board.
(*d*) „ 34—Boxes.

5. In case of the *eleven tests* enumerated below, points may be assigned "by implication" according to the following schedule:

Brief Scale Score	No. and Name of Test	Points by Implication
35 or more ..	(*a*) No. 11—*Drawing a Square* ..	.. 1
35 „ ..	(*b*) „ 15—Fingers	.. 3
45 „ ..	(*c*) „ 16—Naming Six Coins ..	.. 2
50 „ ..	(*d*) „ 13—Prettier Faces	.. 3
50 „ ..	(*e*) „ 19—Adding	.. 1
50 „ ..	(*f*) „ 21—Making Change	.. 3
50 „ ..	(*g*) „ 22—Adaptation Board ..	.. 5
50 „ ..	(*h*) „ 23—Oblong Card	.. 1
55 „ ..	(*i*) „ 12—Drawing a Diamond ..	.. 1
55 „ ..	(*j*) „ 20—Counting Backward ..	.. 1
55 „ ..	(*k*) „ 24—Colours	.. 4

3.	(3) Goddard Form-board	9 Points
4.	(10) Two Designs ..	6 „
5.	(11) Copying a Square ..	1 „
6.	(12) Copying a Diamond ..	1 „
7.	(22) Adaptation Board ..	5 „
8.	(23) Oblong Card ..	1 „
9.	(33) Healy Form-board ..	3 „
	Total	40 Points

Of these nine tests, four are also included in the Brief Scale.

The following Table of Age-Norms may be consulted:

TABLE III

MENTAL AGE EQUIVALENTS FOR THE NON-VERBAL SCALE

POINTS	MENTAL AGE (MONTHS)	POINTS	MENTAL AGE (MONTHS)	POINTS	MENTAL AGE (MONTHS)
1	54	11	78	21	116
2	56	12	81	22	120
3	58	13	84	23	126
4	60	14	87	24	132
5	62	15	90	25	140
6	64	16	94	26	150
7	66	17	98	27	162
8	69	18	102	28	174
9	72	19	106	29	186
10	75	20	110		

The same facts are shown graphically in Fig. XXIV (*b*), Part II, p. 127.

§ (13) List of Materials required for the Hindustani Binet-Performance Tests

COINS. Silver rupee, silver 8-, 4-, and 2-anna 1-anna piece, 13 pice. (For Tests 16 and A5.)

6. Four tests remain. These may be omitted only under circumstances noted:

(*a*) Test No. 18—Abstract Definitions. This test may be omitted, and scored *nil* "by implication," only when *no points* have been scored in Concrete Definitions.

(*b*) Test No. 27—Similarities between Three Things. In the same way, this test may be scored *nil* "by implication," if *no score* has been made in Two Similarities.

(*c*) Test No. 31—Absurdities. As above, if *no score* has been made in Comprehension.

(*d*) Test No. 35—Rajah and Deputy Commissioner. As above, if, and only if, *no score* has been made in Concrete Differences.

§ (12) A Non-Verbal Short Scale. Nine Tests

There are nine of the thirty-five tests of the point scale which may rightly be called non-verbal. These tests, while they require an oral explanation by the examiner, involve in response only drawing or manipulation by the child. The procedure is such that if the child is not unmistakably feeble-minded he will, without exception, understand the instructions. This scale may be employed in cases in which there is obvious linguistic difficulty. Where such difficulty is only suspected the Non-Verbal scores may be separately computed and used for comparative study. The claim cannot be made that N-V. scores are a measure of a specific aptitude rather than of general mental capacity.

THE NON-VERBAL TESTS ARE:

1. (1) Knox Cubes .. 10 Points
2. (2) Weights .. .. 4 „

3.	(3) Goddard Form-board	9 Points
4.	(10) Two Designs ..	6 ,,
5.	(11) Copying a Square ..	1 ,,
6.	(12) Copying a Diamond ..	1 ,,
7.	(22) Adaptation Board ..	5 ,,
8.	(23) Oblong Card ..	1 ,,
9.	(33) Healy Form-board ..	3 ,,
	Total	40 Points

Of these nine tests, four are also included in the Brief Scale.

The following Table of Age-Norms may be consulted:

TABLE III

MENTAL AGE EQUIVALENTS FOR THE NON-VERBAL SCALE

POINTS	MENTAL AGE (MONTHS)	POINTS	MENTAL AGE (MONTHS)	POINTS	MENTAL AGE (MONTHS)
1	54	11	78	21	116
2	56	12	81	22	120
3	58	13	84	23	126
4	60	14	87	24	132
5	62	15	90	25	140
6	64	16	94	26	150
7	66	17	98	27	162
8	69	18	102	28	174
9	72	19	106	29	186
10	75	20	110		

The same facts are shown graphically in Fig. XXIV (*b*), Part II, p. 127.

§ (13) List of Materials required for the Hindustani Binet-Performance Tests

1. COINS. Silver rupee, silver 8-, 4-, and 2-anna pieces, 1-anna piece, 13 pice. (For Tests 16 and A5.)

2. WEIGHTS. Five boxes, 14 x 23 x 43 mm. ($\frac{1}{2}$ x $1\frac{1}{8}$ x $1\frac{3}{4}$ inches), weighing respectively 3, 6, 10, 15, and 21 grams ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{5}{6}$, $1\frac{1}{4}$, and $1\frac{3}{4}$ tolas). Small pill boxes of uniform size and appearance, and weighted in the same proportions as the matchboxes above described, are quite suitable. (For Test 2.)

3. CARDS. One plain stiff card, 3 x 5 inches. One similar card cut diagonally into triangular halves. (For Test 23.)

4. PLAIN PAPERS. A supply of rectangular sheets of plain paper, size about 5 x 6 inches. (For Test 32.)

5. WATCH, SHOWING SECONDS. (For Tests 3, 9, 10, 33, A7, etc.)

6. KNIFE, PEN (QALAM), AND KEY. All should be of a type familiar to village children. A folding pen-knife, or a modern flat key should not be used. (For Tests A1, A4.)

7. SOFT LEAD PENCILS. One for scoring, and one for the child in the Drawing Tests. (For Tests 10, 29, 32, 11, 12.)

8. PICTURES. (*a*) Panjab Household Scene. (For Test 7.)
   (*b*) Village Well and Group of Men. (For Test 7.)
   (*c*) Ekka and Passengers. (For Test 7.)
   (*d*) Three Pairs of Faces—Hindustani types. (For Test 13.)
   (*e*) Four Figures with Missing Features. (For Test 14.)

These pictures, printed on separate cards, may also be had from the author.

9. CARDS WITH DESIGNS:[1]

(*a*) Square, $1\frac{1}{2}$ inch on a side. (For Test 11.)

(*b*) Diamond, $2\frac{3}{4}$ inches long, and $1\frac{1}{2}$ inches broad. (For Test 12.)

(*c*) Two parallel lines, 2 and $2\frac{3}{8}$ inches in length, respectively; 1 inch apart, with middle points opposite. (For Test A3.)

(*d*) Truncated Pyramid and Greek Key designs for memory drawing. (For Test 10.)

All the above to be drawn on plain white cards in heavy black lines (preferably with draughtsman's ink), one twenty-fourth of an inch in breadth.

10. CARD WITH COLOURS. Red, yellow, blue and green strips, each $2\frac{3}{8} \times \frac{3}{8}$ inches, glued to a card in this order from above downward. They are placed three-quarters of an inch apart. Correct spectral (rainbow) colours should be used. If not available elsewhere, we can supply the proper colours. (For Test 24.)

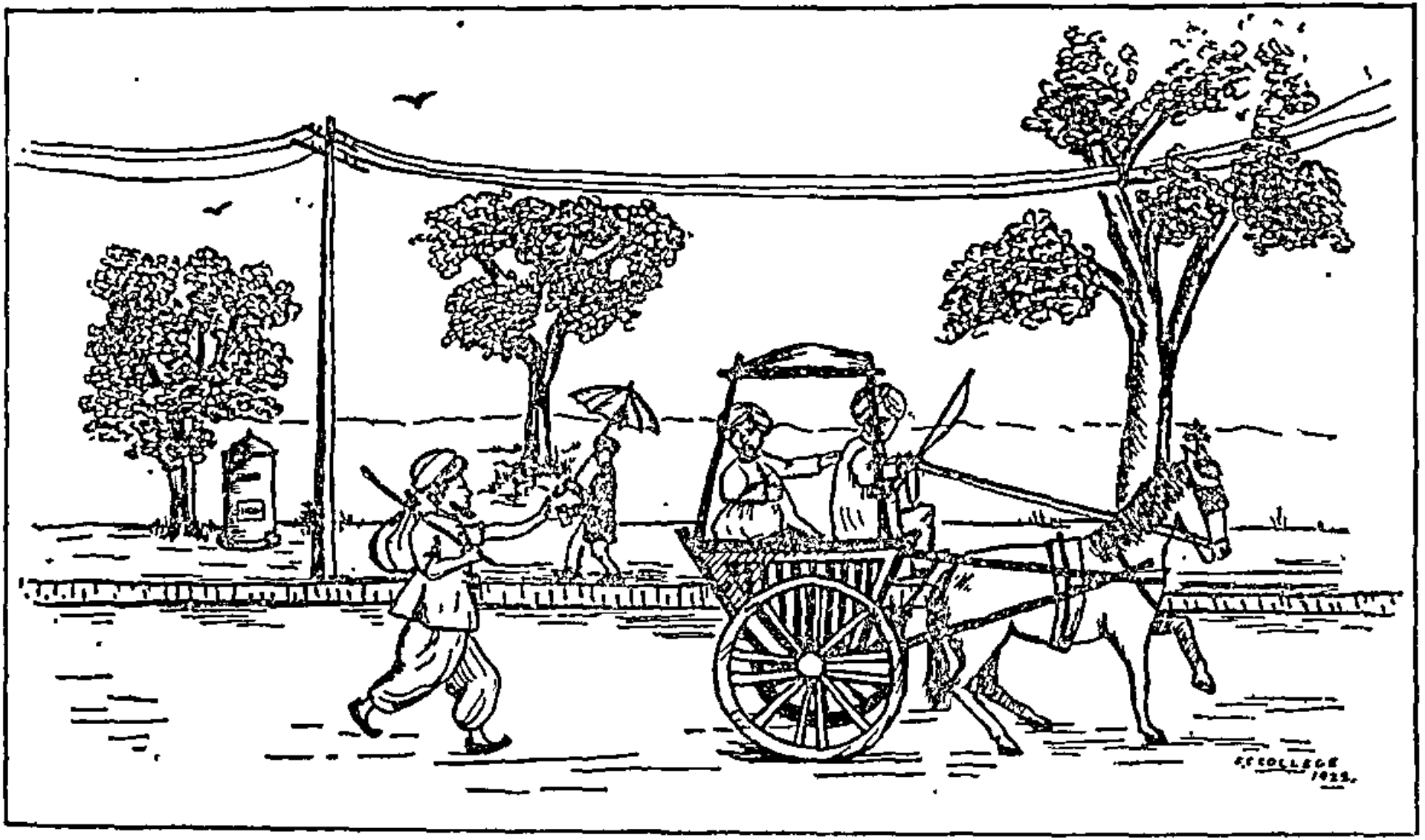
11. KNOX CUBES. (For Test 1; complete specifications are given in the text of the test, § 6.)

12. GODDARD FORM-BOARD. (For Test 3; specifications in text, § 6.)

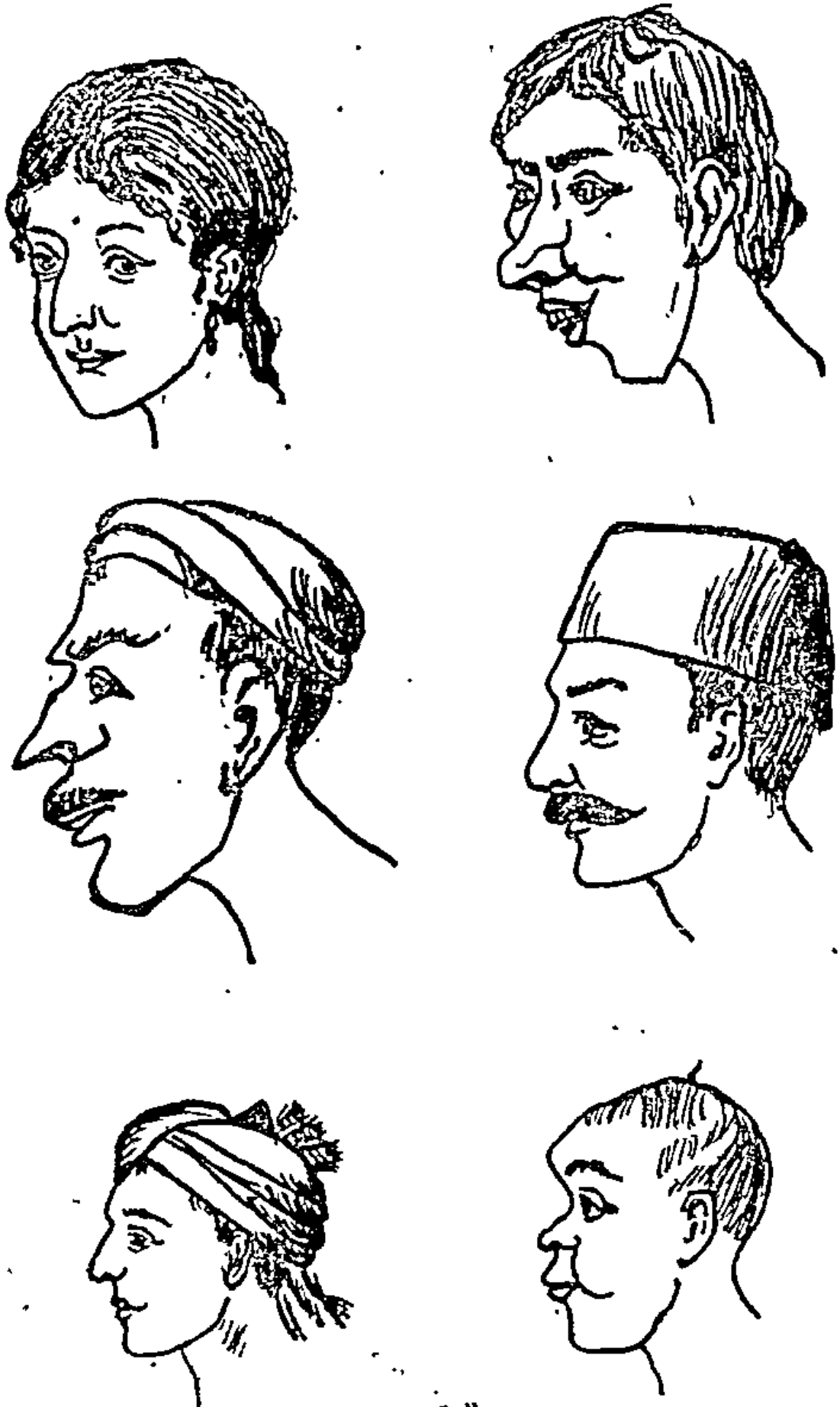
13. ADAPTATION BOARD. (For Test 22; specifications in text, § 6.)

14. HEALY FORM-BOARD. (For Test *33*; specifications in text, § 6.)

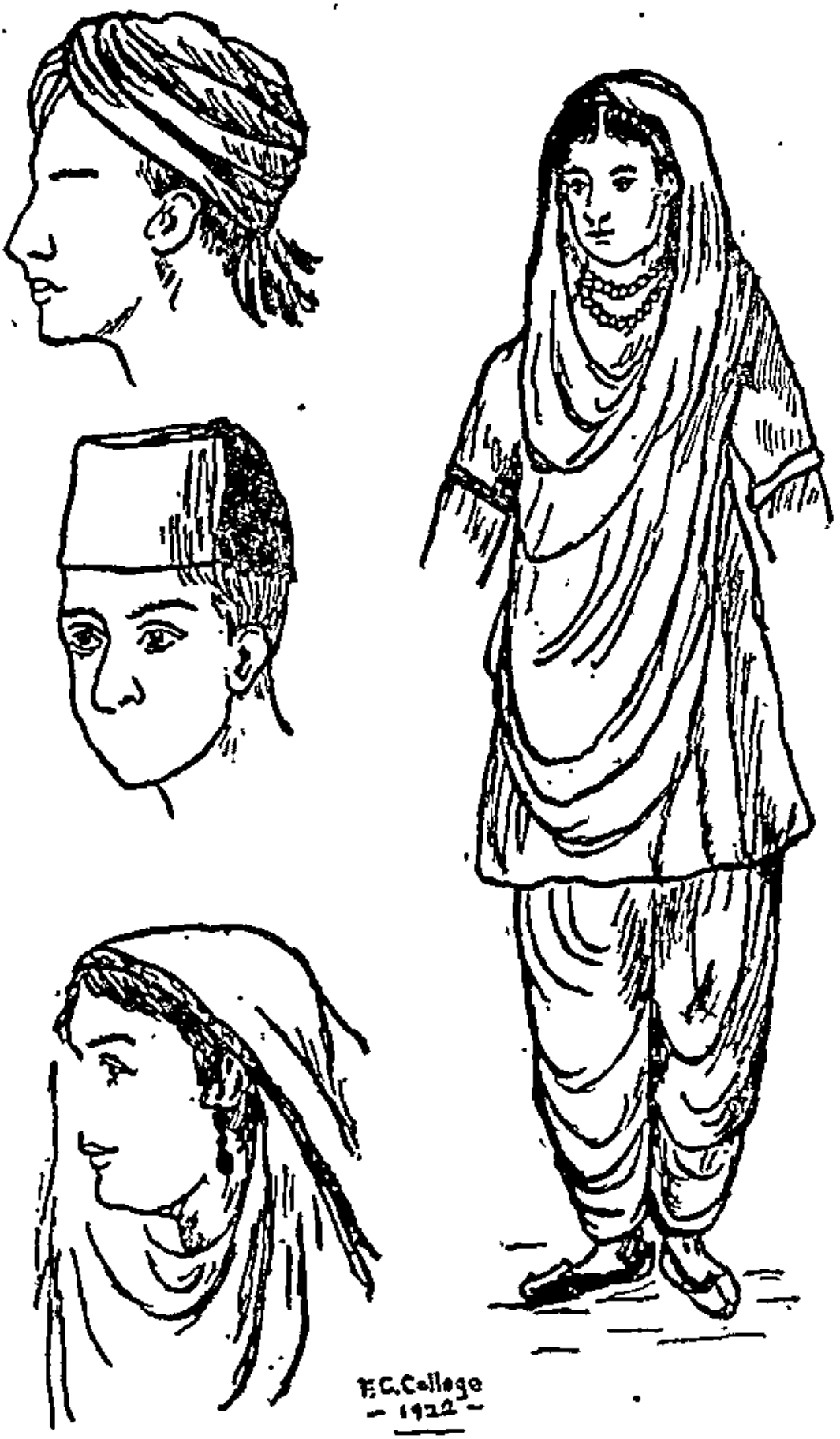
[1] These cards are as supplied in the "Test Materials" supplement to Terman's *Measurement of Intelligence*. Scoring Cards for Tests 10, 11, 12 and 29 are also included in this material.



THIRD PICTURE, TEST NO. 7



FOURTH PICTURE, TEST NO. 13



FIFTH PICTURE, TEST NO. 14

PART II

THE STANDARDIZATION OF THE SCALE

(A) THE SUBJECTS OF THE TESTS

§ (15) The Boys Examined

The scale here described is the result of an investigation carried on in Lahore and nearby cities and villages in 1922 and 1923. In the standardizing of these tests 1,070 boys, varying in age from 5 to 16, all attending school, were examined. Of this number, 50 cases from the Delhi Reformatory and 85 from certain other schools were subsequently rejected for various reasons, including uncertain age records and incomplete testing. Thus 929 cases remain, as will be seen from the total figures in Tables IV and V, § 15 and § 16.

The boys tested come from 37 different schools. Five of these schools furnished only 2 or 3 cases each, and 7 more are represented by less than 12 boys each. In the remaining 25 schools the boys examined vary from 12 to 79 in number. Table IV (§ 15) shows the number of boys from the various schools or groups of schools classified according to age and caste.

CASTE GROUPS. From the outset all scores were tabulated separately according to the following "Caste" groups:

1. "C"—Chuhras (Depressed Classes).
2. "X"—Christians. (In this group only those boys have been taken whose parents have come from among the Chuhras.)
3. "M"—Muhammadans.

4. "S"—Sikhs.
5. "B"—Brahmins.
6. "K"—Non-Brahmin Hindus.

These six classes represent well-marked divisions of the people of the Panjab. It may be said that they are not all "castes" in the usual and accepted sense of the term. The Brahmins are a major caste of the Hindus in such a sense. The Chuhras are the sweeper caste of the Panjab, and according to Hindu practice are held to be "untouchable."

The Muhammadans and Sikhs are, of course, not castes at all, but special religious communities. Within their own bounds they contain for the most part the same racial strains and occupational divisions represented in the caste-system of the Hindus of the Panjab. They do represent distinct cultures, and differ in dress and custom and linguistic heritage.

The non-Brahmin Hindus are, if not a caste, at least correctly called a caste division. They include all Hindus of the middle classes, excluding Brahmins at the top and "Untouchables" at the bottom of the Hindu social scale.

As stated above, we have examined no Christian boys from families who have come from amongst the Muhammadans or higher-class Hindus. Our 170 Christian boys are all from the villages, are all children of Christian parents of Chuhra origin, and are all from families which have become Christians comparatively recently. The number whose grandparents were Christians would be perhaps less than half. The number whose great-grandparents were Christians would be negligible.

Of these 170 Christian boys, 61 report that their fathers are occupied as village teachers or preachers or hospital assistants; 26 are engaged in trades or subordinate clerkships or domestic service; 83 are labour-

ers, of whom all but 12 are farm labourers. It may be taken as certain, therefore, that of the 170 Christian boys, 87 are of literate and 83 of quite illiterate parentage. None of their grandparents would have been literate. The racial strain in these 170 boys is purely that of the Chuhra. The culture is that of the village "untouchable" quarter, and of the Mission village school, plus, in about half of the cases, the teacher's or preacher's home. This home is raised above its neighbours, not in prosperity and elegance, but in cleanliness, and in the spirit of hope and progress and self-respect. In this home there will be a *Bible and, possibly, a few school books and pictures.*

By reference to Table III it may be seen to what extent our 929 boys represent the total population and the total school-population of the Panjab (see Table III, overleaf). It will be noted that the proportion of non-Brahmin Hindus, Sikhs and Chuhras examined corresponds quite closely with the proportion of these classes to the total population and to the total school-population. The number of Christian boys and Brahmin boys considerably exceed their general proportion to the population, but in order to secure a sufficient number of cases to give a basis for inter-caste comparisons this excess was deemed legitimate. The number of Muhammadan boys examined is much fewer than their proportion to the population would warrant, but is still quite sufficient to serve as a basis of comparison. It is also true that our proportion of Muhammadan cases is more representative in the higher classes than the total percentage would indicate. In primary schools Hindu and Muhammadan boys are found in very fair proportion to the size of the two communities. In secondary schools, however, we find that the proportion of Muhammadan to Hindu boys falls from about 150 per cent. to 85 per cent.

TABLE IV

SHOWING THE TOTAL POPULATION OF THE PANJAB; THE SCHOOL-POPULATION OF THE PANJAB, OF LAHORE DISTRICT, AND OF LAHORE, FEROZEPUR AND JULLUNDUR DISTRICTS COMBINED; AND THE NUMBER OF BOYS TESTED—ALL BY CASTES; WITH PERCENTAGES

	CHUHRA	CHRISTIAN	MUHAMMADAN	SIKH	Brahmin	Non-Brahmin	TOTAL HINDUS	GRAND TOTAL
Total Population, Panjab—								
No.	749,687	332,939	12,813,383	3,107,296	997,499	8,799,606	9,797,105	25,101,060
Per cent.	3	1	48	12	3	33	36	100
Total School Population, Panjab—								
No.	6,530	7,143	283,332	80,969	..	..	217,118	597,447
Per cent.	1	1	48	14	..	..	36	100
School Population, Lahore District—								
No.	572	500	15,126	4,587	..	..	9,769	30,747
Per cent.	2	2	50	15	..	..	31	100
School Population, Lahore, Ferozepur and Jullundur Districts—								
No.	2,732	745	38,385	19,103	..	..	27,860	89,018
Per cent.	3	1	43	22	..	..	31	100
Total Boys Tested—								
No.	35	170	185	124	153	263	415	929
Per cent.	4	18	20	14	16	28	44	100

In almost all cases our records include also the sub-caste. There are 156 sub-castes included in the schedules of the late census of this province. The cases we have examined have reported themselves under 128 such sub-caste or tribal divisions. Thus our Chuhra boys reported 4 sub-castes; Brahmins, 23; non-Brahmin Hindus, 46; Sikhs, 21; and Muhammadans, 34. It might be possible to draw further conclusions with reference to the most important sub-divisions of the Hindus, Muhammadans and Sikhs. The Chuhras, as well as the Brahmins, are commonly understood to be sub-divisions of the Hindus.

§ (16) The Schools Visited

All of our boys were attending school at the time of examination. The 37 schools visited by us in the course of our investigation were as follows:

C.M. Government Central Model School, Lahore.

I.S. Islamia High School, and Branch School, Sheranwala Gate, Lahore; and Islamia Primary School, Changar Mohalla, Lahore.

R.M. Rang Mahal Mission High School, Lahore.

S.D. Sanatan Dharm High School, and Branch Schools, Lahore.

O.L. Other Lahore schools, including the D.A.V. Middle School, and the Municipal Board Primary School, Gwal Mandi, Lahore.

M.O. Mission Training School for Village Boys, Moga.

S.M. Six other Mission schools, including the Salvation Army Boys' School, Lahore; and the Hira Mandi, Sande, and Clarkabad Schools for Village Boys.

G.S. The George Hindu High School, Gujranwala; and the Arya High School, Sialkot.

K.H. Five Khalsa (Sikh) schools in Lahore, Gujranwala, and Sialkot.

H.B. The Har Bhagwan Hindu High School, and Branch School, Ferozepur.

R.H. Government and Municipal Board Schools in Rahon, Jullundur District.

S.W. Arya Private School for Boys of the Depressed, Classes, Rahon.

A.T. A.S. Primary Schools in Aur and Taprian, Jullundur District.

M.E. M.E. Mission School for Village Christian Boys Lahore.

TABLE V

SHOWING THE SCHOOLS VISITED, AND THE NUMBER OF BOYS TESTED BY AGES AND BY CASTES

SCHOOL	AGE												TOTAL
	5	6	7	8	9	10	11	12	13	14	15	16	
C.M.	..	..	..	..	12	5	16	17	10	3	3	..	66
I.S.	1	4	8	10	12	10	10	5	1	1	1	..	63
R.M.	2	3	3	11	9	14	6	7	5	1	2	..	63
S.D.	3	16	26	17	19	14	5	16	6	7	4	3	136
O.L.	2	6	6	4	3	3	3	4	6	1	..	..	38
M.O.	3	2	4	6	3	9	10	10	5	5	3	2	59
S.M.	..	5	5	4	10	6	7	9	2	9	2	..	62
G.S.	..	..	4	2	8	13	9	1	3	5	1	..	46
K.H.	..	2	2	6	6	10	11	7	6	4	..	..	54
H.B.	..	..	3	16	18	8	7	5	1	1	..	..	59
R.H.	2	9	10	14	14	9	21	13	6	14	12	4	128
S.W.	..	..	..	1	6	6	7	4	1	..	..	..	25
A.T.	..	3	12	12	2	6	7	21	12	..	..	..	75
M.E.	..	..	4	7	9	6	5	7	9	5	3	..	55
TOTAL ..	13	50	87	110	131	119	124	126	73	56	31	9	929

School	Caste						Total
	C	X	M	S	B	K	
C.M.	..	..	21	6	8	31	66
I.S.	..	..	63	..	..	..	63
R.M.	..	1	28	9	6	19	63
S.D.	..	..	..	21	64	51	136
O.L.	..	..	5	6	6	21	38
M.O.	..	59	..	..	..	..	59
S.M.	5	55	..	1	..	1	62
G.S.	..	..	..	5	34	7	46
K.H.	..	..	1	49	..	4	54
H.B.	..	..	10	3	7	39	59
R.H.	..	..	35	18	16	59	128
S.W.	25	..	..	..	..	..	25
A.T.	5	..	22	6	11	31	75
M.E.	..	55	..	..	..	..	55
Total ..	35	170	185	124	152	263	929

We have grouped these 37 schools under 14 heads as above. The 14 pairs of initial letters re-appear in Table V, in which is shown the number of boys at each age and of each caste who were examined in each school or group of schools.

The schools visited will be seen to include almost every type of school in what may be called the Common School System of the Province. There are Government schools, mission schools, communal schools; schools conducted by municipalities, district boards or religious bodies; expensive schools, and schools for less prosperous families; schools big and little—in city and in village. We believe that in this respect again our selection of boys is representative within the Panjab environment.

In the smaller schools it was possible to avoid an unrepresentative selection of boys by fixing in advance the approximate number from certain castes, ages and

classes that were desired. In larger schools, if there was likelihood that the teachers might put forward their best boys only, in order to make a specially good showing for the school or for the religious community, we frequently adopted the following method of selection. A group of boys were first chosen who, by their own report, were at or near the expected age for their grade. The teachers were asked to pick out a few of the best and a few of the poorest in such groups. The boys to be examined were then taken from amongst those remaining.

§ (17) Distribution of Boys Examined by Caste and Age

Table VI shows at a glance the number of boys of each caste at each age; and, similarly, the age distribution of each of our caste groups.

TABLE VI

AGE AND CASTE OF BOYS EXAMINED

AGE GROUPS	CASTES						TOTAL
	C	X	M	S	B	K	
V	1	2	4	..	2	4	13
VI	..	6	9	7	10	18	50
VII	..	12	21	11	11	32	87
VIII	1	17	24	11	16	39	110
IX	8	20	26	15	21	41	131
X	7	21	22	16	19	34	119
XI	8	23	27	18	18	30	124
XII	9	24	25	15	17	36	126
XIII	1	16	11	15	14	16	73
XIV	..	19	8	9	13	7	56
XV	..	8	7	5	7	4	31
XVI	..	2	1	2	2	2	9
TOTAL ..	35	170	185	124	152	263	929

Examination of Table VI will show that for Ages VIII to XII inclusive we have well over 100 boys each.

The numbers in Ages VII and XIII are not inconsiderable. Conclusions based upon the 50 cases at Age VI, and the 56 cases at Age XIV, would have to be taken as not very secure; while for Ages V, XV and XVI the numbers are so small that the results can only be provisional.

TABLE VII

Percentage Distribution of Boys Examined by Ages and Castes

Year-Group	No. of Cases	Chuhras		Christians		Muhammadans		Sikhs		Brahmins		Non-Brahmins	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
V	13	1	8	2	15	4	31	..	..	2	15	4	31
VI	50	..	..	6	12	9	18	7	14	10	20	18	36
VII	87	..	..	12	14	21	24	11	13	11	13	32	37
VIII	110	1	1	17	16	24	23	11	10	18	16	39	35
IX	131	8	6	20	15	26	20	15	12	21	16	41	31
X	119	7	6	21	18	22	19	16	13	19	16	34	29
XI	124	8	7	23	19	27	22	18	15	18	15	30	23
XII	126	9	7	24	19	25	20	15	12	17	14	36	29
XIII	73	1	1	16	22	11	15	15	21	14	19	16	22
XIV	56	..	..	19	34	8	14	9	16	13	23	7	13
XV	31	..	..	8	26	7	23	5	16	7	23	4	13
XVI	9	..	..	2	22	1	11	2	22	2	22	2	22
Total ..	929	35	4	170	18	185	20	124	13	152	17	263	28

Table VII indicates the percentage distribution of boys of each caste at each age, and in the total. By comparison with Table IV, it will be seen that in the eight age-groups from VI to XIII there is fair agreement between the proportionate distribution of castes at each age and in the total, and the distribution of

these classes in the general school population of the Panjab.

THE AVERAGE AGE OF OUR YEAR-GROUPS. In the year-groups here, and subsequently referred to, we have classed all boys who have passed their fifth birthday, but have not reached their sixth, in the V-year group; all who have passed their sixth but have not reached their seventh, in the VI-year group, etc. The result of this grouping is that the average age of each year-group falls about midway between birthdays. Table VIII shows that in every age except XVI (where there are only 9 cases), *the average age of the group stands at 5 or 6 or 7* months—i.e. just midway between the age limits represented by the group.

TABLE VIII

DISTRIBUTION OF AGES IN MONTHS FOR EACH YEAR-GROUP

YEAR-GROUPS		V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
TOTAL NO. OF CASES		13	50	87	110	131	119	124	126	73	56	31	9
Months in Excess of Basal Age	.0	..	6	5	5	9	13	14	11	11	4	5	..
	.1	..	3	8	13	13	6	4	8	2	6	1	2
	.2	..	..	9	6	12	7	9	15	8	3	3	2
	.3	1	3	4	5	14	9	11	9	8	1	2	..
	.4	2	2	15	12	15	12	10	14	7	6	6	2
	.5	..	3	7	17	8	12	15	12	3	9	3	1
	.6	2	7	10	7	12	11	16	15	9	6	2	..
	.7	3	5	5	14	16	10	11	12	9	4	1	..
	.8	1	3	5	9	6	8	6	14	5	4	2	1
	.9	1	8	7	7	7	11	9	5	4	3	1	..
	.10	1	6	9	6	11	16	9	6	3	4	2	1
	.11	2	4	3	9	8	4	10	5	4	6	3	..
AVERAGE AGE ..		5.7	6.6	7.6	8.6	9.5	10.6	11.5	12.5	13.5	14.5	15.5	16.4
MEDIAN AGE ..		5.7	6.7	7.5	8.5	9.5	10.6	11.5	12.5	13.5	14.5	15.4	16.4

(B) THE TESTS

§(18) *The Tests Eliminated*

THE REJECTED TESTS. In addition to the 35 tests retained in our scale, 32 others were experimented with or at least considered, and later rejected or omitted. The grounds of their elimination may here be reported.

1. UNSUITABLE FOR A HINDUSTANI SCALE

(a) Giving the Date (S.R. IX 1).

For several reasons this test is omitted.

While the English calendar is in quite general use in all modern schools, there are also Hindu and Muhammadan calendars and their varying nomenclatures to be reckoned with.

It is only children in school who happen to be writing properly headed and dated exercises who would have the day of the week in mind. This is, no doubt, partially true in Western countries as well. The value of this test has been brought in question on other considerations also.[1]

(b) Days of the Week (S.R. VII Al. 1).

To most Hindu children days come and go, one being much like another until some festal day breaks the monotony. There is not the same experience of seven-day periods broken by regularly recurring days that are different. This may not be equally true of Muhammadan children, or of Hindu children in families belonging to certain sects. In any case, the common

[1] Cf. Briham, "Two Studies in Mentals Tests," *Psychological Monograph*, No. 102, 1917, p. 55.

experience upon which such a test is based does not here obtain.

(c) Morning or Afternoon (S.R. VI A1. 1).

Morning and *evening* are distinct in common Indian usage, but morning and *afternoon* are not as clearly distinguished as in the West. There is no noon bell, whistle, or meal. Many do not hear the hours told off by clock or bell. Noon (*din ke do pahar kā waqt*), i.e. "the time of the second watch of the day," is not a *point* of time, but rather a middle *period*. City dwellers might question these statements, but nevertheless they must be taken into account in preparing test questions equally applicable to city and country children.

(d) Age (S.R. V A1).

Parents themselves are often unable to state the ages of their children exactly, and have to consult a horoscopic record in order to report to the school authorities or to the examiner. Birthdays are not celebrated as in the West. Even older children's reports of their own ages are often from one to three years in error as compared with the birth records.

(e) Giving Family Name (S.R. III 5).

This test is inapplicable as it stands. The practice of using family names is not at all general in India. For example, a boy may be Muhammad Bakhsh, son of Ibrahim Khalil. In recent years the name of the clan or sub-caste is often used as a surname by men in business or the professions. The practice is not common, however, and probably would not be known to a small child in any case.

It was thought that the same purpose might be served

by changing the test to (*a*) What is your name? (*b*) What is your father's name? The boys we have examined hitherto have all been of five years of age or over, and were all in school. Their answers to these questions have been almost invariably correct. As modified, this test has proven too easy for our scale.

(f) Tying a Bow-Knot (S.R. VII 4).

Indian boys do not wear laced shoes or neckties, and as yet only an infinitesimal number have had any scouting practice. The prime sources of experience with bow-knots, both single and double, are therefore lacking. We have devised a modification of this test, using a knot common in India, but have not as yet given it a sufficient trial. It may be that if a test on this analogy is to be retained, the best form would be the fastening of a pile of books into a square cloth by tying the diagonal corners together in pairs.

(g) Giving the Value of Stamps (S.R. IX Al. 2).

This test appears in our scale in its original form with coins (Test 19). The Indian two-anna and one-anna coins afford a problem equivalent to the Binet-Simon Test No. 4, Age VII (1911), "Adding six sous, three of which are double." To use stamps would be obviously unsuitable for Indian children.

(h) The Clock Puzzle (S.R. XIV 6).

The Clock Test, while giving a quite satisfactory curve for Ages IX to XV, can only be given to those children who first report that they can "tell the time." Our curve for 219 subjects to whom this test was given is, therefore, not indicative of a general capacity. We have retained it in the supplementary list of Additional Tests (Test A 6), for further experiment.

(i) Resisting Suggestion (B.S. XII 1 (1911); B. 57).

The erratic character of our curve based upon 279 cases, Ages V to XVI, confirms the general opinion that this test is not a good one (cf. Burt, op. cit., p. 62).

(j) "Comprehension, 2nd Degree" (S.R. VI 4).

The nine questions of our Comprehension Test (Test 8) follow closely the analogy, or are translations of, the Stanford Comprehension Tests, 1st, 3rd, and 4th Degree. The questions used in the Stanford Comprehension Test, 2nd Degree, are not suitable in the Panjab.

Take, for example, the question "What should you do if it is raining when you start to school?" So varied a range of answers is possible that evaluation would be difficult; e.g. "Take off my shoes," "Take an umbrella," "Call a tonga" "Go back home" (school may in fact be dismissed!), etc.

The question about the burning house is also unsuitable, as fires are practically unheard of.

The question about missing a car, even when modified to *train* or *cart*, is not equally suitable for city and village conditions. Here again the range of possible answers is so varied that it would be difficult to discriminate between the intelligent and unintelligent ones; e.g. "Sit and wait for the next train," "Go next day," "Not go," "Go home," all might be in accordance with recognised practice!

2. Unsuitable on Account of Language Difficulty

(a) Vocabulary Test (S.R. VIII 6, etc.).

Various vocabulary lists were made and examined. It was discovered that in a list of 100 Urdu words the

proportion of words of Sanskrit origin coming into Urdu through the Hindi, and of words of Arabic origin coming in through the Persian, could not be left to the equalization of chance. Also that Hindu and Muhammadan children would be unequally handicapped in case of any disproportion. We believe that it will be very difficult to prepare a vocabulary test suitable for all Urdu-speaking children.

(b) Dictation (S.R. VIII Al. 2).

All tests requiring writing have been omitted, on account of the variety of scripts in use. In Panjab schools we find that while a virtually common vocabulary is used, children are being taught to write in Persian, Hindi, Gurmukhi, or Roman characters. No attempt has yet been made to prepare a rating scale for any one of these scripts.

(c) Reading and Report (S.R. X 4).

All reading tests have been discarded, for the reason given in connection with the Dictation Test above. The difficulty of the various characters obtains even when the vocabulary in question is simple and practically identical. It is also true that these scripts are phonetic in differing degrees.

(d) Giving Differences between Abstract Terms (S.R. XVI 3).

In this test the language difficulty again enters. There is a larger proportion of words of Arabic than of Sanskrit derivation in Urdu. Most abstract terms of this type are from one or the other source. Muhammadan children and Hindu children in Muhammadan areas will be more familiar with the first than with the second. An inequality is introduced which does not necessarily obtain in the more homely terms of the common vocabulary.

(e) Dissected Sentences (S.R. XII 4).

The difficulty of various scripts here again makes the test unsuitable, except within a limited group of Urdu-speaking children.

3. Too Easy or Too Difficult for the Age-Range Tested

(a) Pointing to Parts of the Body (S.R. III 1).

(b) Right and Left (S.R. VI 1).

(c) Counting Four Pice (S.R. IV 3).

(d) Counting Thirteen Pice (S.R. VI 3).

(e) Naming Familiar Objects (S.R. III 2).

(f) Repeating Six Syllables (S.R. III 6).

(g) Repeating Twenty-eight Syllables (S.R. VI Al. 1).

All but the last of the above tests have been used, and the results are available for further standardization. (d), (e) and (f) are included among the Additional Tests as A5, A1 and A2.

4. Not Yet Tried out in the Panjab

(a) Giving Sex (S.R. III 4).

As our cases have all been of boys in attendance upon schools for boys only, we could not secure any data on this test.

(b) Triple Order (S.R. V 6).

(c) Comparison of Lines (S.R. IV 1).

(d) Discrimination of Forms (S.R. IV 2).

(e) Reversed Triangle (B. 63).

It was feared that this test would require cumbersome language, and especially the technical expressions of the mathematics class.

(f) Hervieu's Reflections on Life (S.R. XVIII 4).

(g) Interpretation of Fables (S.R. XII 5).

There are many Indian fables suitable for use in such a test. We have not yet undertaken to use or standardize any such. It may be anticipated that such fables should be chosen as do not have too obvious or stereotyped a moral commonly appended.

(h) Ingenuity Test (S.R. XVIII 6).

On *a priori* grounds this would seem to be a most suitable test for India. The weighing and measuring of all sorts of commodities in vessels of various sizes is a common household procedure. The small ready-measured commercial package is almost unknown.

(i) Arithmetical Reasoning (S.R. XIV 5).

This would be the simplest of all tests to adapt, though scarcely distinguishable from ordinary school examination questions.

(j) Comprehension of Physical Relations (S.R. XVI A1. 2).

A similar test might be very useful. Tests of this character based on some of Burt's Reasoning Tests have been used in Hindustani by Mr. H. Wyatt, former Principal of the Central Training College, Lahore. The tests have been reported in the *Panjab Educational Journal*, but no data are available as yet.

(k) Other Performance Tests.

A number of the other tests from the Pintner-Paterson Performance Scale would warrant trial in India. Those of the nature of picture puzzles would have to be greatly modified, and introduced with much caution.

Of the above ten tests (b), (c) and (h) have been included among the Additional Tests as A4, A3 and A7.

An additional reason for omission in the case of several of the tests enumerated above as unsuitable, notably Vocabulary, Fables, and Ingenuity, was the element of *time*. The examination already requires at least 45 to 50 minutes. To add to its length would make it impracticable from the outset. This same consideration led to various modifications in certain of the tests which were included.

§ (19) The Variation with Increasing Age of Scores in the Individual Tests

PASS PERCENTAGES AND THE ORDER OF THE TESTS. The 35 tests of the Point Scale are arranged in the order which has proven to be the most convenient and suitable for administration. This cannot be said to be the serial order of difficulty, as the graded scoring employed recognizes both easy and difficult degrees within the same test. In general, it may be said, however, that the easiest tests come at the beginning and the hardest tests at the end. Other considerations determining the order are (1) the securing of interest and co-operation by beginning with blocks and pictures rather than with tests requiring language responses; (2) the logical sequence of tests as seen in Digits Forward and Digits Backward, Differences and Similarities, Easy and Difficult Drawings—in these instances the "set" produced by the first test being regarded as a necessary preliminary to the procedure of the test which follows; (3) the relieving of monotony by varying the character of the tests as much as possible;

and (4) the securing of these same ends in the Brief Scale of 10 tests as well as in the complete series.

In the Point Scale a table of pass-percentages at the several ages cannot present as striking a display of increasing scores as can be had from a similar table in the case of tests of the all-or-none variety, assigned to their various year-groups in order. If the single items, which including zero scores are altogether 205 in number, were to be so arranged, we would have a table made up of 2,460 percentage values. For the purpose of displaying the increase of scores in each test age by age, and thus to justify the inclusion of the test in a scale upon which norms of mental age are based, we have thought it sufficient to take a middle or most frequent score for each test, and from the percentages of boys at each age who attain this score construct a representative curve for the test.

In Table IX the percentage of passes at each age for one representative score in each of the 35 tests may be seen. In any case in which a test was given to less than the entire number of boys (929 in all), a score "by implication" has been assigned. (The method of this assignment is described in § 19 below.) In this table, therefore, the percentages are as for 929 boys in every case in the total, and for the entire year-group without exception in each of the 12 age columns. In the last column the "Total Percentage" is not an average of age percentages, but the actual percentage of all the 929 boys, of those who, regardless of age, passed the item.

In Figure X we have represented graphically the same increases in pass percentage as are recorded in Table IX. It is evident from these curves that our test scores increase consistently with the increasing age and the developing mentality of our boys.

TABLE IX

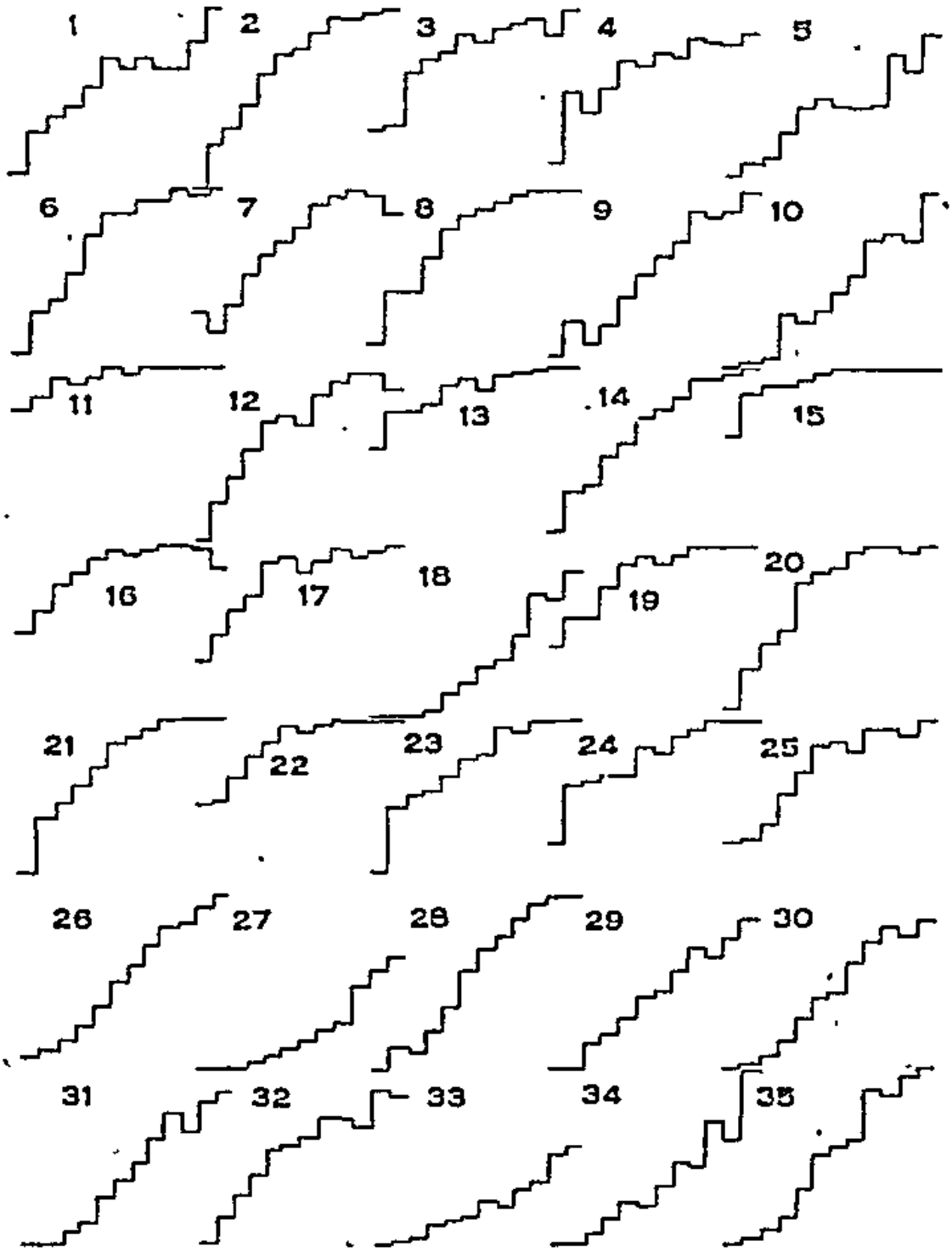
Pass Percentages by Ages

Each Test being Represented by a Single Item of Medium Difficulty

No.	Test	Item	Age Groups												Total	
			V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	No.	Per cent.
1	K. C. ..	4	8	30	40	45	56	71	65	72	67	66	81	100	551	58
2	WTS. ..	3	0	21	33	47	63	76	78	87	95	95	97	100	635	68
3	G. F-B. ..	4	31	32	65	72	78	87	82	90	93	95	87	100	734	79
4	D. F. ..	4	15	54	42	56	72	70	77	75	85	84	81	89	637	68
5	D. B. ..	3	8	14	18	34	49	50	48	48	49	77	68	89	411	44
6	SYLS. ..	5	8	32	40	53	75	87	89	95	96	100	97	100	705	76
7	PICTS. ..	3	31	20	38	55	64	72	80	91	97	100	97	89	655	70
8	QUESTS...	5	15	46	46	65	80	89	90	94	99	100	100	100	736	79
9	WORDS ..	5	8	28	14	25	42	56	65	75	90	89	90	100	504	54
10	2 DES. ..	3	0	2	8	31	29	35	46	56	74	77	74	100	372	40
11	SQ ..	1	77	84	93	90	94	100	98	100	100	100	100	100	889	96
12	DIAMD. ..	1	0	24	38	51	70	73	68	85	92	97	97	89	630	68
13	FACES ..	3	54	76	76	80	91	93	88	97	99	99	100	100	823	89
14	FEATS. ..	2	8	30	31	50	59	73	77	84	95	95	97	100	625	67
15	FINGS. ..	3	61	86	90	90	95	98	100	100	100	100	100	100	889	96
16	COINS ..	2	54	68	82	88	95	99	97	99	100	100	100	89	765	82
17	C. DEFS...	4	38	52	66	73	92	95	87	93	99	96	97	100	782	84
18	A. DEFS...	3	0	0	1	8	20	24	35	39	52	77	74	89	270	29
19	ADDING.	1	46	62	62	80	91	95	92	98	100	100	100	100	823	89
20	20–1 ..	1	8	32	48	55	81	89	90	98	100	100	97	100	734	79
21	CHANGE	2	15	46	56	65	76	89	91	96	100	100	100	100	753	81
22	AD. BD. ..	3	54	58	69	81	89	98	94	98	100	100	100	100	827	89
23	OB. CD. ..	1	15	52	60	62	70	80	81	98	97	98	100	100	725	78
24	COLS ..	3	30	66	68	70	70	87	83	92	97	100	100	100	754	81
25	DIFFS. ..	2	31	32	41	60	71	88	89	84	97	97	94	100	699	75
26	2 SIMS. ..	2	8	10	16	25	37	50	60	71	82	84	94	100	467	50
27	3 SIMS. ..	3	0	0	0	2	8	11	15	22	27	49	58	67	143	15
28	WD. ST. ..	3	0	12	10	23	37	58	70	79	89	97	100	100	503	54
29	BL. FLD...	2	0	0	14	20	30	42	44	57	70	64	74	89	367	39
30	RHYM. ..	2	0	2	7	17	31	42	45	61	74	82	77	89	383	41
31	ABSURDS.	2	0	0	9	11	30	39	49	61	78	68	81	89	371	40
32	PAPER ..	3	0	16	29	40	53	57	61	74	73	70	90	89	507	55
33	H. F-B. ..	2	0	2	3	11	13	16	25	23	33	37	52	56	177	19
34	BOXES ..	2	0	0	6	15	27	26	34	49	48	73	61	100	296	32
35	R. and D.C.	1	0	2	6	17	34	52	59	60	90	88	97	100	446	48
	Total Boys at		13	50	87	110	131	119	124	126	73	56	31	9	929	

FIGURE X PASS PERCENTAGES BY AGES

35 Tests as in Table IX



In each curve the 12 horizontal spaces indicate Ages V-XVI, and the 10 vertical spaces Percentages.

TABLE XI

PASS PERCENTAGE OF ALL TEN-YEAR-OLD BOYS IN THE SEVERAL ITEMS OF EACH TEST

No.	TEST	ITEMS									
		1	2	3	4	5	6	7	8	9	10
1	K.C.	97	88	82	71	51	16	8	2	0	0
2	WTS.	98	78	76	69						
3	G. F-B. ..	98	97	92	87	79	65	39	7	1	
4	D. F.	100	95	85	70	43	9				
5	D. B.	56	52	50	22	19	19	3	3	3	0
6	SYLS... ..	92	91	90	89	87	75	65	46	9	6
7	PICTS. ..	87	80	72	24	13	7				
8	*QUESTS.* ..	100	100	100	93	89	73	50	29	8	
9	WDS.	98	94	85	70	56	48	32	28	18	11
10	DES.	58	53	35	27	14	12				
11	SQ.	100									
12	DIAM. ..	73									
13	FACES ..	99	97	93							
14	*FEATS.* ..	98	73	55	40						
15	FINGS. ..	100	100	98							
16	COINS ..	99	98								
17	C. DEFS. ..	98	98	96	96	70	60	49	36		
18	*A. DEFS.* ..	56	40	24							
19	ADDING. ..	95									
20	20–1	89									
21	CHANGE .	98	89	82							
22	AD. BD. ..	100	99	98	81	60					
23	OB. CD. ..	80									
24	COLS... ..	99	98	87	77						
25	DIFFS. ..	95	88	66							
26	2 SIMS. ..	62	50	35	14						
27	3 SIMS. ..	22	13	11	6	1					
28	WD. ST. ..	63	62	58	40	39	38				
29	BL. FLD. ..	61	42	19	10	4					
30	RHYM. ..	58	42	40							
31	*ABSUR.* ..	64	39	18	5						
32	PAPER ..	88	77	51	44	29	14				
33	H. F-B. ..	30	16	3							
34	BOXES ..	56	26	10	5						
35	R. and D. C. ..	52	18	7							

We may now take our 10-year group as a sample, and observe the manner in which the individual tests differentiate capacities within the group. The percent-

age of our 119 10-year-old boys who have passed each test at the several degrees of difficulty is shown in Table XI.

The Table is to be read as follows: In Test 1, Knox Cubes, 97 per cent. of all 10-year-old boys score 1 or more; 88 per cent., 2 or more; 82 per cent., 3 or more; 71 per cent., 4 or more; 51 per cent., 5 or more; 16 per cent., 6 or more; etc., etc.

§ (20) Scoring by Implication

In § 11 is presented a set of rules for the omission of certain very easy or very difficult tests on the basis of the scores already secured in the ten tests of the Brief scale, and for the assignment of scores "by implication" to such omitted tests. It goes without saying that these rules could only be formulated after a large number of examinations had been completed without any such omissions.

In the course of our experiment it became obvious that to put every boy through the entire series of tests without exception was quite impossible. To begin with, there were many tests in our original series which were only discovered to be unsuitable during the actual course of testing. Then, again, to extend the time of the examination to the point of weariness would defeat its own end. Some basis upon which the easiest tests could be omitted in the case of the older and superior boys, and the most difficult in the case of the younger or inferior boys, had early in the investigation to be discovered. This end was the more easily secured, inasmuch as during the experiment the tests were being given as a year-scale. First, provisionally, and later at three different times on the basis of results already secured, they were arranged item by item (73 items in all) in the order of difficulty, and assigned to ages. Pass per-

centages were calculated for each degree or item of each test at all ages, and when the papers were re-scored on the Point scale basis, a complete schedule was made for the scoring "by implication" of various tests which in the examination of any particular child might have been omitted.

A pass percentage of 80 or above was taken as the basis for the award of any score by implication. For example, if the examiner had credited a boy with a pass in any omitted item in the Year scale examination, this credit was accepted for purposes of Point scale score, provided the pass percentage in that item for all boys of similar mental age was 80 or above. The following table (Table XII) shows in the case of four such tests the nature of this schedule.

TABLE XII

SCHEDULE SHOWING NUMBER OF POINTS EARNED BY IMPLICATION BY BOYS OF MENTAL AGE ALREADY APPROXIMATELY DETERMINED: FOUR SAMPLE TESTS

No.	Test	No. of Times Given		Mental Age V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
16	Coins	593	Item (points) ..	1	2	2	2	2	2	2	2	2	2	2	2
			Passes % ..	80	77	83	86	94	98	98	98	100	100	100	100
			Score given by implication	0	1	2	2	2	2	2	2	2	2	2	2
21	Change	687	Item	1	1	1	1	2	3	3	3	3	3	3	3
			Passes % ..		64	63	85	75	89	89	94	100	97	100	100
			Score given ..	0	0	0	1	2	3	3	3	3	3	3	3
23	OB. CD.	651	Item	1	1	1	1	1	1	1	1	1	1	1	1
			Passes % ..		56	59	69	74	89	83	98	100	94	100	100
			Score given ..	0	0	0	0	0	1	1	1	1	1	1	1
27	3 Sim.	878	Item	1	1	1	1	1	1	1	1	1	1	2	2
			Passes % ..	0	2	1	5	15	16	23	33	50	60	75	70
			Score given ..	0	0	0	0	0	0	0	0	0	0	1	2

The table may be read as follows: In Test 16, Naming Coins, which was given to 593 boys, at Age V, a score of 1 was earned by 80 per cent. of the boys taking the test; at Age VI a score of 2 was earned by 77 per cent.; at Age VII, a score of 2 by 83 per cent., etc. It was decided that in the case of boys from whose examination this test had been omitted, no score by implication at Mental Age V, a score of 1 at Mental Age VI, and a score of 2 at Mental Age VII and onward, should be awarded. As a matter of fact, it would seldom or never be omitted below the mental age of ten.

In the re-scoring of the tests by the Point scale method it was discovered that this schedule of implication left the scores unchanged in 419 of the 929 cases. In 196 other cases they were changed by only one point in either direction. This change represents an average mental age difference of only five weeks. Only one-third of the total number of cases were changed by as much as two points. The correlation (Pearson)[1] between the former Year scale mental ages and the Point scale mental ages by year-groups is as follows:

Age	No. of Cases	Correlation	Age	No. of Cases	Correlation
V ..	13	.85	XI ..	124	.96
VI ..	50	.93	XII ..	126	.95
VII ..	87	.96	XIII ..	73	.89
VIII ..	110	.96	XIV ..	56	.94
IX ..	131	.91	XV ..	31	.83
X ..	119	.91	XVI ..	9	.92
			Total ..	929	.98

The benefit of the doubt must be given to the Point scale scores, though the close agreement indicates that

[1] All co-efficients of correlation reported in this study have been computed by the Pearson product-moment formula.

the examiners using the scale as a Year scale were employing quite a sound basis for the omission of tests.

§ (21) *Special Note on the Goddard Form-Board*

As the standard "Goddard" Form-boards manufactured by Stoelting & Co. were not available in India, it was thought feasible to have boards made up in Lahore from the specifications given by Sylvester,[1] and quoted by Pintner and Paterson (op. cit., pp. 30 f.). These specifications are quite explicit, except in one important particular. With reference to the amount of play between the blocks and their recesses, Sylvester merely says, "each of the blocks fits loosely into its corresponding recess." As results have shown, there may be many degrees of "looseness." The scores made on our Lahore boards were much inferior to those recorded elsewhere. On comparing the Lahore form-board with the standard boards it became evident that our blocks, while really "loose," had very much less free play within the recesses, and that much of the difference in scores was due to this fact.

We at once prepared standard boards, and examined 627 boys from a number of Lahore schools on this test alone. From Table XIII the norms for the various ages obtained from Lahore boards and standard boards may be read. The number of boys examined in either case is also shown. For purposes of comparison the medians for American children, quoted by Pintner and Paterson, are given, as well as the medians for Brahmin and Panchama children in Madras, as reported by Herrick.[2]

[1] R. H. Sylvester, "The Form-Board Test," *Psych. Monographs*, Vol. XV, No. 4.

[2] D. S. Herrick, "Comparison of Brahmin and Panchama children in South India with each other and with American children by means of the Goddard Form-board," *Journal of Applied Psych.*, Sept., 1921, Vol. V, pp. 253–60.

TABLE XIII

NORMS FOR LAHORE AND STANDARD GODDARD FORM-BOARDS

AGES	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	TOTAL
Lahore Form-board													
Number of Boys ..	13	58	112	116	132	123	124	155	96	62	36	10	1037
Median Scores(secs.)	48	48	38	32	29	27	25	25	24	22	20	18	..
Standard Form-board (Stoelting)													
Lahore Boys (No.)	11	29	60	49	57	72	72	67	51	52	42	65	627
Median Scores ..	39	30	25	23	20	17	17	15	15	13	13	13	..
Average Scores	38	32	28	22	21	18	17	16	15	13	13	13	..
American Children (Pint.-Pat.) (No.)	80	170	173	206	214	221	172	141	80	80	..	..	1537
Median Scores ..	37	26	23	20	18	16	15	14	12	11	..	..	..
Madras Children (Herrick) (No.) ..	16	36	59	39	33	30 (29)	37	39	35	22	..	..	346
Median Scores:													
Panchamas ..	40	37	31	26	26	25	23	20	20	20	..	..	..
Brahmins ..	37	33	28	28	24	23	21	21	19	17	..	..	..

The Lahore form-boards have been discarded. Hereafter only standard boards are to be used. Table XIV will indicate the equivalent scores on the Lahore board and the standard board. In the second part of the table a conversion table of Point scores is given. This conversion table has been constructed as follows: All form-board scores, regardless of age, have been averaged. Five points have been assigned to those scores within the range of one quarter sigma above and one quarter sigma below the mean; 6 points to the half sigma above this division; 4 points to the next half sigma below, etc.

§ (23) Point Scale Norms

The norms provisionally published on the basis of 929 cases and used throughout this study are reported in Table XVI, and shown graphically in Fig. XVIIa. In Part I (p. 73) are found the revised norms based upon 1,388 cases, including the original 929 and a subsequent 459.

An examination of Fig. XVII in connection with the average and median scores of Table XV, and the average and median ages of Table VIII will show how the mid-points of the curve for each age were first fixed. Thus, for example, at Age V the median and average scores are 31 (Table XV). The median age for the year group is 5 years and 7 months (Table VIII). Taking the mid-point between the year limits at the bottom of Fig. XVII, and moving upward to 31 on the vertical scale of scores, we find a point of departure for the curve of norms. The other points are similarly found, and joined together.

These points are fixed in three cases at the coincidence of average and median; in one case at the average; in one case at the median; in four cases between the average and median; and in three cases at one point above or below either; in every case the endeavour being to secure an evenly "stepped" set of mental age values, and a close agreement of chronological age and mental age in the several age groups to be subjected to study. Norms for Ages IV, V, XVI, XVII and XVIII are determined by projecting the curve in either direction. The number of cases at these five ages is so small that no reliance can be placed on the points determined by their average scores. A reasonable conjecture at this stage would be that the curvilinear tendency shown in

the data of Table XV, p. 113 (bold figures), would be established by the examination of further cases in the higher ages, and that we would have a flattened curve at the upper end. This we find to be clearly the case in the revised curve of norms, Fig. XVIIb, where also the number of additional cases examined at each age are shown. No further reference can be made to these additional cases, nor use made of the revised norms, as they were secured many months after the study here reported was completed.

The rectilinear projections of the curve in Fig. XVIIa represent the mental age values assigned to the 929 point scores hereafter referred to.

TABLE XVI

POINT SCALE NORMS AND MENTAL AGES (929 CASES)

POINTS	MENTAL AGE	POINTS	MENTAL AGE	POINTS	MENTAL AGE
10 ..	46	30 ..	65	50 ..	85 VII. 1
11 ..	47	31 ..	66	51 ..	86
12 ..	48 IV	32 ..	67	52 ..	88
13 ..	49	33 ..	68	53 ..	89
14 ..	50	34 ..	69	54 ..	90
15 ..	51	35 ..	70	55 ..	92
16 ..	52	36 ..	71	56 ..	93
17 ..	53	37 ..	71	57 ..	94
18 ..	54	38 ..	72 VI	58 ..	95
19 ..	55	39 ..	73	59 ..	96 VIII
20 ..	56	40 ..	74	60 ..	98
21 ..	57	41 ..	75	61 ..	99
22 ..	58	42 ..	76	62 ..	100
23 ..	59	43 ..	77	63 ..	101
24 ..	60 V	44 ..	77	64 ..	102
25 ..	60	45 ..	78	65 ..	103
26 ..	61	46 ..	79	66 ..	103
27 ..	62	47 ..	80	67 ..	104
28 ..	63	48 ..	82	68 ..	105
29 ..	64	49 ..	83	69 ..	105

TABLE XVI (*Contd.*)

Point Scale Norms and Mental Ages (929 Cases)

Points	Mental Age	Points	Mental Age	Points	Mental Age
70 ..	106	100 ..	141	130 ..	194
71 ..	107	101 ..	143	131 ..	195
72 ..	107	102 ..	144 XII	132 ..	196
73 ..	108 IX	103 ..	146	133 ..	197
74 ..	109	104 ..	148	134 ..	198
75 ..	109	105 ..	150	135 ..	199
76 ..	110	106 ..	151	136 ..	201
77 ..	111	107 ..	152	137 ..	202
78 ..	111	108 ..	154	138 ..	203
79 ..	112	109 ..	156 XIII	139 ..	204 XVII
80 ..	113	110 ..	157	140 ..	205
81 ..	113	111 ..	158	141 ..	206
82 ..	114	112 ..	160	142 ..	207
83 ..	115	113 ..	161	143 ..	209
84 ..	116	114 ..	162	144 ..	210
85 ..	118	115 ..	164	145 ..	211
86 ..	119	116 ..	166	146 ..	212
87 ..	120 X	117 ..	168 XIV	147 ..	213
88 ..	121	118 ..	170	148 ..	214
89 ..	122	119 ..	172	149 ..	215
90 ..	123	120 ..	174	150 ..	216 XVIII
91 ..	125	121 ..	178	151 ..	217
92 ..	126	122 ..	182 XV.2	152 ..	218
93 ..	128	123 ..	186	153 ..	220
94 ..	130	124 ..	187	154 ..	221
95 ..	132 XI	125 ..	188	155 ..	222
96 ..	134	126 ..	189	156 ..	223
97 ..	136	127 ..	190	157 ..	224
98 ..	138	128 ..	192 XVI	158 ..	225
99 ..	140	129 ..	193	159 ..	227
				160 ..	228 XIX

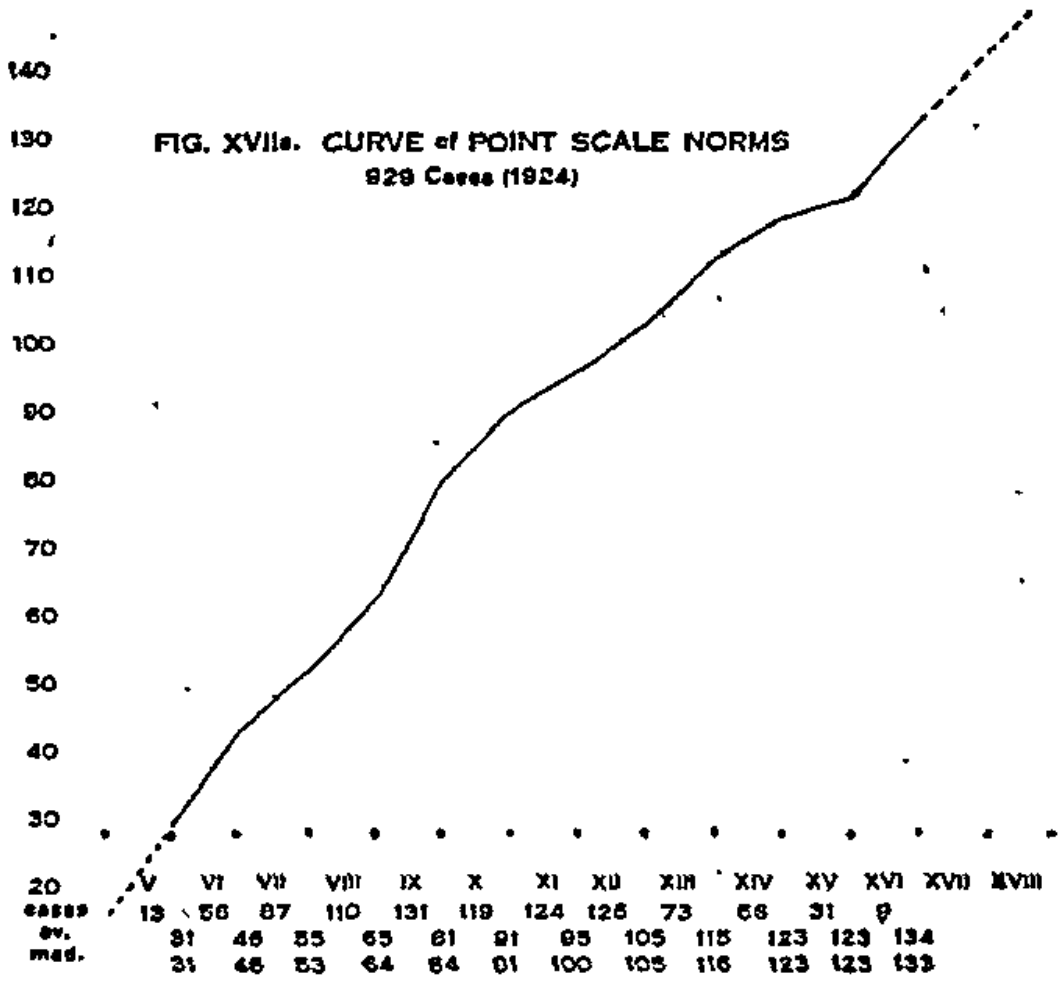


FIG. XVIIa. CURVE of POINT SCALE NORMS
929 Cases (1924)
140
130
120
110
100
90
80
70
60
50
40
30
20
V VI VII VIII IX X XI XII XIII XIV XV XVI XVII XVIII
cases 13 56 87 110 131 119 124 126 73 68 31 9
av. 31 46 55 65 61 91 95 105 115 123 123 134
med. 31 46 53 64 64 91 100 105 116 123 123 133

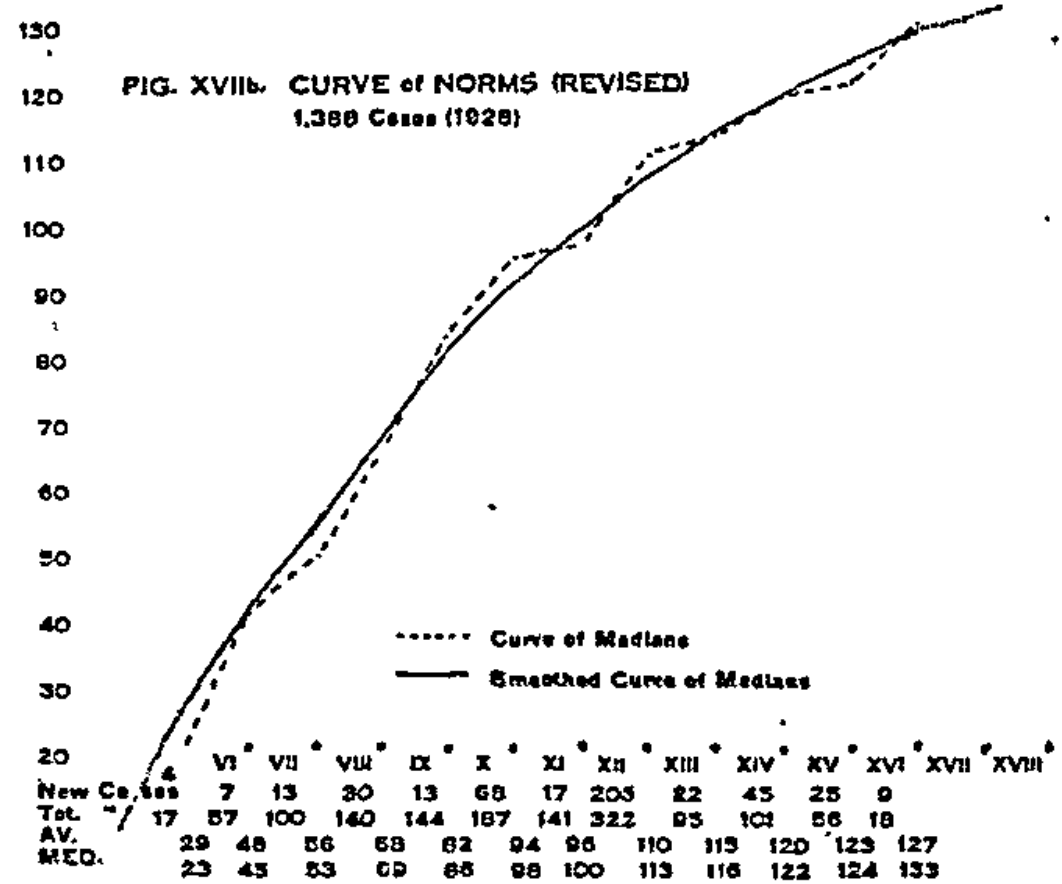


FIG. XVIIb. CURVE of NORMS (REVISED)
1,388 Cases (1926)
130
120
110
100
90
80
70
60
50
40
30
20
Curve of Medians
Smoothed Curve of Medians
V VI VII VIII IX X XI XII XIII XIV XV XVI XVII XVIII
New Cases 7 13 30 13 68 17 205 82 45 25 9
Tot. " 17 57 100 140 144 187 141 322 93 101 56 18
AV. 29 48 56 58 62 94 96 110 113 120 123 127
MED. 23 45 53 59 66 98 100 113 116 122 124 133

§ (24) Mental Ages

The Agreement of Mental Age with Chronological Age. The figures of Table XVIII indicate to what extent the 929 mental ages determined from the above norms correspond, age for age, with chronological age by year-groups. The average actual age of each year-group is given in Column 3. Columns 5 and 7 show the median and average mental age for these groups. In most cases the agreement between chronological age and mental age is quite close. At Ages IX, X, XIV and XV it is shown that the elimination of a few scattered cases lying above or below the major distribution would bring the median mental age into similar agreement.

TABLE XVIII

MEDIAN AND AVERAGE MENTAL AGES BY YEAR-GROUPS

No. of Cases	Age Group	Average Chron. Age	Cases Elim'd	Median Mental Age		Average Mental Age	
				Months	Yrs. Mos.	Months	Yrs. Mos.
13	V	5.7		66	5.6	66	5.6
50	VI	6.6		80	6.8	80	6.8
87	VII	7.6		88	7.4	90	7.6
110	VIII	8.6		102.5	8.6+	102.2	8.6
131	IX	9.5		115	9.7	120	10.0
"	"	"	(10 cases: 1 low, 9 high)	112	9.4	115.2	9.7
119	X	10.6		132	11.0	133.6	11.1
"	"	"	(9 cases: 1 low, 8 high)	126	10.6	129.7	10.9
124	XI	11.5		141	11.9	137.8	11.6
126	XII	12.5		150	12.6	150.7	12.6
73	XIII	13.5		166	13.10	166.6	13.10+
56	XIV	14.5		184	15.4	176	14.8
"	"	"	(2 high cases)	177	14.9		
31	XV	15.5		186	15.6	179	14.11
"	"	"	(2 low cases)	188	15.8	187	15.7
9	XVI	16.4		197	16.5	197.5	16.5
929							

§ (25) Hindustani Intelligence Quotients[1]

Distribution of H.I.Q.'s by Ages. In Table XIX are shown the Hindustani Intelligence Quotients of all of our 929 boys, tabulated by 5's, for each age. The figures in Column 1 are the mid-values of the groups of 5. Median and average H.I.Q.'s for each age are shown at the foot of the table. These are computed from the actual H.I.Q.'s, not from the grouped array. Columns 16, 17 and 18 enable us to read off the percentages of schoolboys of all ages whose H.I.Q. is at, or below, or above any given value. Thus in Column 16 we find that 2 per cent. of all boys have an H.I.Q. of 65, i.e. of 63 to 67; 9.3 per cent., an H.I.Q. of 100, etc. In Column 17 these percentages are summated downward; in Column 18, upward. Thus from Column 17 we read—19 per cent. of all boys have an H.I.Q. of 82 or below; and from Column 18—18 per cent. have an H.I.Q. of 123 or above, etc.

At this point it may be well to compare these ranges of I.Q.'s with those reported by Terman for the Stanford Binet Scale.[2] It is at once evident that we have a much wider distribution of I.Q.'s in the Hindustani scale, and that we could by no means adopt Terman's classification of average, superior, and inferior minds, and of geniuses and defectives, with their various sub-divisions, on the basis of the I.Q.'s reported by him or any other writer. We can report the range of I.Q.'s achieved by the same proportion of our total group as fall into any of his classes. Or we can simply present a percentile table of I.Q.'s achieved by Panjabi schoolboys on the Hindustani scale. This seems the sounder procedure, as it makes no assumption as to the limits of normality, of genius, or of deficiency (Table XVIII).

[1] Here and hereafter we shall refer to all I.Q.'s computed upon H.B.-P.S. scores as Hindustani Intelligence Quotients (H.I.Q.'s). The reason for this will appear from the paragraphs at the end of this Section, p. 123.

[2] Cf. Terman, op. cit., pp. 78–79.

TABLE XIX

Distribution of Hindustani Intelligence Quotients

	Columns																
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
H.I.Q.	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	No.	No. Sum	%	% Sum Down	% Sum Up
45							1						1	1	0.1	0.1	100
50					2		1	1					4	5	0.4	0.5	99.9
55				1	3	1	4	1					10	15	1.1	1.6	99.5
60				4	5		1						10	25	1.1	2.7	98.4
65	1		3	6	3	1	2	1		2			19	44	2.0	4.7	97.3
70	1	2	5	3	4	4	4	3	2	1			29	73	3.1	7.8	95.3
75		2	8	7	4	6	8	11	2	2	2		52	125	5.6	13.5	92.2
80		3	5	9	4	7	8	10	2	2	1		51	176	5.5	19.0	86.6
85	2	8	10	6	7	10	9	8	5	1	3		69	245	7.4	26.4	81.1
90	2	3	4	5	10	13	9	14	6	7	5	1	79	324	8.5	34.8	73.7
95	1	5	7	6	11	10	8	8	8	11	3	1	79	403	8.5	43.3	65.2
100	1	2	9	12	14	6	8	13	10	2	5	5	87	490	9.3	52.7	56.7
105	1	3	5	17	7	3	5	11	8	4	9		73	563	7.8	60.6	47.3
110		2	8	6	7	9	18	11	7	6	1	2	77	640	8.3	68.8	39.4
115	1	6	7	10	6	7	9	4	3	13	2		68	708	7.3	76.2	31.2
120	2	4	3	4	9	8	7	3	12	2			54	762	5.7	82.0	23.8
125		3	4	3	4	9	7	10	4	3			47	809	5.0	87.0	18.0
130		1	1		5	8	4	10	3				32	841	3.4	90 4	13 0

135	1	1	1	1	6	6	4	1	1				22	863	2.4	92.8	9.6
140		2	1	4	6	2	3	5					23	886	2.5	95.3	7.2
145		1	1	1	4	1	2						10	896	1.1	96.3	4.7
150		1		2	2	4	2						11	907	1.2	97.5	3.7
155		1		1		3		1					6	913	0.6	98.2	2.5
160			3		1	1							5	918	0.5	98.7	1.8
165					3								3	921	0.3	99.0	1.3
170				1	2								3	924	0.3	99.4	1.0
175			1	1	1								3	927	0.3	99.7	0.6
180																	
185			1										1	928	0.1	99.8	0.3
190					1								1	929	0.1	100.0	0.1
TOTAL	13	50	87	110	131	119	124	126	73	56	31	9	929		100		
MED.	96	102	98	100.5	102	104	102	99.5	103	99.5	101	100	101				
AVE.	98.2	104.6	101	99.5	106.2	106.6	100.5	101.1	103.6	101.3	97.1	100.1	102.4				
RANGE	64-137	69-155	64-187	53-175	50-189	56-162	45-151	53-153	68-134	63-106	75-115	88-109	45-189				
25%ile	87	86	83	81	88	88	81	85	93	92	89	98	84				
75%ile	115	117	114	111	125	124	114	116	120	114	106	102	119				
Q	14	15.5	15.5	15	18.5	18	16.5	15.5	18.5	16	8.5	2	17.5				

TABLE XX

PERCENTILE TABLE OF H.I.Q.'s

PER CENT. OF 929 BOYS	HINDUSTANI I.Q.	STANFORD I.Q. FOR SAME PER CENT.	PER CENT. OF 929 BOYS	HINDUSTANI I.Q.	STANFORD I.Q. FOR SAME PER CENT.
Highest 1%	165 or above	130 or above	Lowest 1%	54 or below	70 or below
" 2%	155 "	128 "	" 2%	60 "	73 "
" 3%	151 "	125 "	" 3%	63 "	76 "
" 4%	145 "		" 4%	65 "	
" 5%	141 "	122 "	" 5%	68 "	78 "
" 10%	131 "	116 "	" 10%	75 "	85 "
" 15%	126 "	113 "	" 15%	79 "	88 "
" 20%	120 "	110 "	" 20%	84 "	91 "
" 25%	117 "	108 "	" 25%	87 "	92 "
" 30%	114 "		" 30%	90 "	
" 33%	111 "	106 "	" 33%	92 "	95 "
" 35%	110 "		" 35%	93 "	
" 40%	107 "		" 40%	95 "	

If we should attempt to classify the mentality of our boys on the seven-fold basis employed by Terman, using the same arbitrary percentile divisions between the groups, we would get the following result:

PER CENT. OF CASES	CLASSIFICATION	STANFORD I.Q.	HINDUSTANI I.Q.
Highest 0.5%	*"Genius"*	*140 and up*	*165 and up*
Next 5 %	Very Superior	120–140	140–165
Next 15 %	Superior	110–120	120–140
Middle 60 %	Average	90–110	85–120
Next 15 %	Dull	80– 90	70– 85
Next 5 %	Border-line	*70– 80*	*55– 70*
Lowest 1 %	Feeble-minded	Below 70	Below 55

Our great dispersion of H.I.Q.'s accompanying a not unusual range of mental ages in the several age-groups would seem to demand some explanation. The Hindustani Point Scale represents an initial stage in the development of a *fully valid and stable measuring* instrument. It invites revision, extension, enrichment, and further validation. At this stage there doubtless

are chance errors of mismeasurement. In addition to such, there must also be chance errors in chronological ages as *reported or recorded in school registers.*[1] *All* such would reappear in the ratios (H.I.Q.'s), greatly magnified.

It is clear that we have not an H.I.Q. which can be used interchangeably with the Stanford or other I.Q. It would be possible from Columns 2 and 3, and 5 and 6, of Table XX to compute a scale of Stanford I.Q. and H.I.Q. equivalents.

Wherever possible, it is more satisfactory to use point scores and mental ages, and to deal with age-groups separately. The H.I.Q. is employed in this study wherever it seems desirable to deal with groups more inclusive than single age-groups[2] or where previous studies[3] have suggested such a method.[4]

§ (26) Distribution by Class (Grade) and Age

It is instructive at this point to examine the distribution of our 929 boys by ages and classes (School Grades).[5]

In Table XXI each horizontal line shows the total number of boys in a single school grade, divided into the several age groups. Each vertical column shows the grade distribution of a single age-group. The heavy figures include the expected or normal age-grade location, i.e. the location of boys who entered school after passing

[1] Cf. p. 5 and § 48.

[2] E.g. pp. 135 ff.

[3] Particularly Terman, *The Stanford Revision.*

[4] Cf. pp. 131, 133, 140, etc.

[5] The term "grade" is not common in British or Indian usage. Nevertheless, it will be employed hereafter to denote the various school classes. These are ordinarily ten in number, viz. Ist, IInd, IIIrd, IVth and Vth Primary; Ist, IInd and IIIrd Middle; and IVth and Vth High. The three classes of the Middle School and the two classes of the High School are commonly called the "VIth, VIIth, VIIIth, IXth and Xth Classes."

their sixth birthday, and who earned regular annual promotions thereafter.

TABLE XXI

SHOWING GRADE DISTRIBUTION BY AGES AND AGE DISTRIBUTION BY GRADES

GRADE	AGE												TOTAL
	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	
I	11	28	37	31	18	5	3	4	1	1			139
II	2	22	39	27	16	17	18	6					147
III			9	40	36	20	20	28	2				155
IV			2	10	29	24	8	16	19	4	2	1	115
V				2	30	38	38	18	9	7	3		145
VI					2	14	28	28	17	16	6		111
VII						1	7	18	15	10	4	3	58
VIII							2	7	5	10	7	1	32
IX								1	5	8	7	3	24
X											2	1	3
TOTAL	13	50	87	110	131	119	124	126	73	56	31	9	929

§ (27) Mental Ability and School Progress

Tables XXII and XXIII are devised to show the degree of correspondence between mental ability as measured by our tests, and school progress as indicated by the grade location of pupils. These tables correspond exactly with Table XXI, showing the median M.A. and the median H.I.Q. respectively for each of the age-grade groups given in the separate spaces of that table. While these medians are not in every case sufficiently significant, as, e.g. where they represent only two or three boys, they do demonstrate very clearly the great variation of mental ability in any age or grade. A marked general correspondence between mental ability and school progress is also evident.

In Table XXII the median M.A. for each entire age-group is shown at the foot of the column, and the median M.A. for each entire grade at the end of the line. The table is to be read as follows: At Age V the median M.A. of boys in Grade I is 62; of boys in Grade II is 85; the median M.A. of the entire age group being 66. Similarly, in Grade I the median M.A. of 5 year old boys is 62; of 6 year old boys is 71.5; of 7 year old boys is 75, etc.; the median M.A. of the entire Grade I being 82.

The above paragraph applies exactly to Table XXIII as well, if at every point "H.I.Q." be substituted for "M.A."

TABLE XXII

SHOWING DISTRIBUTION OF MENTAL AGE BY GRADES

GRADE	AGE												MEDIAN OF GRADE
	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	
I	62	71.5	75	82	69	111	103	106	106	107			82
II	85	88	94	94	101	99	103	127					98
III			114	107.5	109.5	112	118.5	120	144				112
IV			148	111	128	135	131	152	150	136	146	193	140
V				158	142	151	142	159	161	162	166		151
VI					144	160	159	157	168	173	182		162
VII						119	182	160	172	169	170	196	172
VIII							198	194	195	196	186	203	194
IX								197	196	201	198	197	198.5
X											101	213	210
MEDIAN OF AGE-GROUP	66	80	88	102.5	115	132	141	150	166	184	186	197	

TABLE XXIII

SHOWING DISTRIBUTION OF H.I.Q.'S BY GRADES

GRADE	AGE												MEDIAN OF GRADE
	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	
I	89	92.5	85	80	61.5	90	77	72	68	64			83
II	126	112.5	106	98	90	78	76.5	86.5					95
III			126	105	99	91.5	86.5	81.5	87.5				95
IV			167	113	116	108.5	97	101	93	78	79.5	100	101
V				152	125.5	117	103.5	108.5	101	96	89		103
VI					122	125	112	106	104	96	99.5		109
VII						92	130	109.5	108	96	93	98	107
VIII							142	127	121	115	102	100	107
IX								129	120	114	104	102	113
X											109	108	108
MEDIAN OF AGE-GROUP	96	102	98	100.5	102	101	102	99.5	103	99.5	101	100	

(D) THE BRIEF SCALE

§ (28) Norms and Mental Ages

The tests of the Brief Scale are enumerated above, and rules for its use with a table of norms are there given.[1]

Figure XXIVa presents the graph from which the values in this table of norms are read off. The mid-points of the curves for the several year-groups were first fixed as in the case of the Point Scale.[2]

In this Figure are presented the Brief Scale curve of norms (broken line), and the revised norms (solid line), from which the values published in Table II, Part I, p. 74, may be read off. The revised curve of norms is the smoothed curve of the medians of 1,388 cases.

[1] §§ 10 and 11, pp. 74 ff.

[2] Cf. § 23 and Fig. XVII.

FIG. XXIV a. BRIEF SCALE NORMS

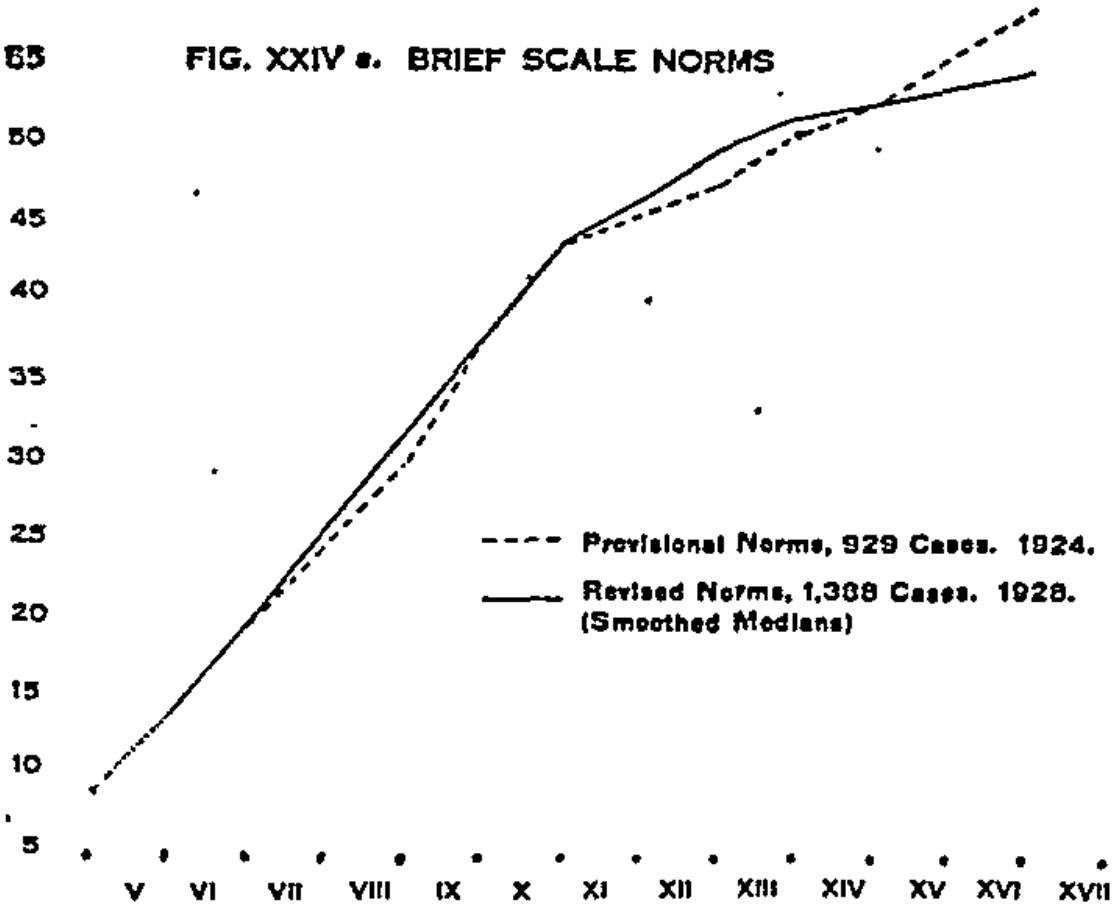
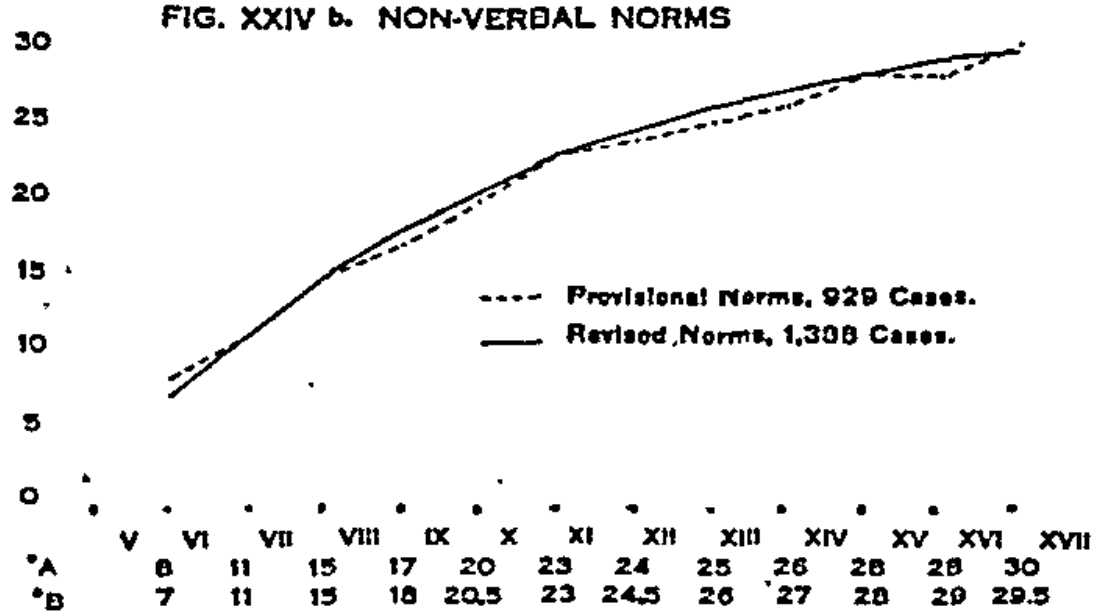


FIG. XXIV b. NON-VERBAL NORMS



*A. Medians, 929 Cases.
*B. Smoothed Medians, 1,388 Cases.

§ (29) The Relation of Brief Scale Scores to Total Scores

The maximum score in the Brief Scale is 82, and that in the Point Scale is 170, the ratio between them being 0.48. The ratios between the total points scored by all boys in the Brief Scale and in the Point Scale, age by age, are:

V .. 0.47	VIII .. 0.46	XI .. 0.46	XIV .. 0.44
VI .. 0.47	IX .. 0.47	XII .. 0.45	XV .. 0.43
VII .. 0.48	X .. 0.50	XIII .. 0.45	XVI .. 0.43

The ratio between the total score in the Brief Scale and in the Point Scale, regardless of age, is 0.462.

In Table XXV are shown the correlations between the Brief Scale and Point Scale scores age by age. The scores are taken by groups of five. These co-efficients range from 0.87 to 0.94 in our first nine age-groups, dropping to 0.77 at Ages XIV, XV and XVI. The total correlation is 0.87 ± 0.0069. This high correlation well justifies the use of the Brief Scale as outlined in §§ 10 and 11.

TABLE XXV

CORRELATION OF BRIEF SCALE AND POINT SCALE SCORES BY AGES

AGE	NUMBER OF CASES	r	P.E.
V	13	.91	.0287
VI	50	.91	.0181
VII	87	.92	.0153
VIII	110	.93	.0128
IX	131	.94	.0105
X	119	.87	.0187
XI	124	.92	.0128
XII	126	.89	.0128
XIII	73	.93	.0153
XIV	56	.77	.0417
XV	31	.77	.0539
XVI	9	.77	.0660
Total	929	.87	.0059

(E) NON-VERBAL TEST SCORES

§ (30) The Relation of Non-Verbal Scores to Total Scores

The tests of the Non-Verbal Short Scale are enumerated in § 12. Norms are reported in Table III, p. 77, and in Fig. XXIV b, p. 127.

Table XXVI exhibits the correlations between the scores made on the non-verbal tests and those on the complete scale.

TABLE XXVI

CORRELATION OF NON-VERBAL SCORES WITH TOTAL SCORES BY AGES

AGE	NUMBER OF CASES	r	P.E.
V	13	.80	.0543
VI	50	.83	.0343
VII	87	.83	.0290
VIII	110	.864	.0187
IX	131	.854	.0187
X	119	.80	.0242
XI	124	.90	.0128
XII	126	.76	.0294
XIII	73	.72	.0411
XIV	56	.75	.0417
XV	31	.475	.1035
XVI	9	.56	.1131
Total ..	929	.905	.0057

It will be seen that we have the high correlation of .90 in the total, and up to Age XI high correlations in the several year-groups. This short scale of 9 non-verbal tests is proposed as an alternative brief scale, for use especially in cases where language difficulty would appear to make the results of the other tests unreliable.

The median non-verbal scores for each age-group may be found in § 43, Table XXXIX.

(F) THE COMPARISON OF TEST RESULTS WITH OTHER CRITERIA

§ (31) Test Results and School Marks

In securing data for correlating test results with school records we found ourselves working under great disadvantages. The methods employed in assigning marks differ greatly from school to school. In some cases we were given a composite record of the boy's marks in all subjects for the previous year. In some cases all that could be secured was the award of the class teacher in the most recent term examination. In many cases, due to the boy's illness in a previous examination, or to his recent migration from some other school, no such record could be had. In very few cases, if any, do the school marks represent a daily classroom record of the boy's school work. They are almost invariably based upon one or more of the periodic set examinations.

These awards were secured for 630 boys. In each school or class the maximum number of marks upon which they were based was ascertained. It was thought necessary to do the computing and ranking ourselves, and accordingly teachers were simply asked to supply the records of school marks. We reduced the marks to percentages, and for each school, or for each class or group within a school, in which the awards had been made on a common basis, we made our own division into five ranks employing, approximately, the following proportions:

Highest 15%, Very Good.	Lowest 15%, Very Poor
Next 20%, Good.	Next 20%, Poor.
Middle 30%, Average.	

It is obvious that in the various schools and communities dealt with, the very good boys of one of our groups might easily fall at or below the average for another, and vice versa. We would expect a correlation table showing considerable scattering.

Table XXVII presents the correlations between H.I.Q.'s and school marks by ages for 630 boys. The total correlation of .25 may possibly be as significant as the .45 reported by Terman, if we consider the character of the school organization with which we are here dealing.[1]

TABLE XXVII

CORRELATIONS OF H.I.Q.'S WITH SCHOOL MARKS BY AGES

AGE	NUMBER OF CASES	r	P.E. (FROM TABLE)
V	5	0	.1508
VI	23	.46	.1267
VII	48	.258	.0915
VIII	67	.28	.0774
IX	94	.262	.0648
X	84	.23	.0774
XI	91	.219	.0643
XII	94	.17	.0678
XIII	54	.231	.0915
XIV	38	−.096	.054
XV	27	.05	.1231
XVI	6	0	.1508
Total ..	630	.251	.0290

§ (32) Test Results and Teachers' Estimates of Intelligence

Teachers' estimates of intelligence, apart from school marks, were secured for 774 boys. The examiners were instructed to secure this rating before the school records were examined or even asked for. Teachers were asked to assign one of the five ratings to each boy, and it was

[1] Cf. Terman, *The Stanford Revision of the Binet-Simon Scale*, p. 105.

explained that what was wanted was for them to judge what the boy had in him—what he could really do in comparison with others, apart from his success or failure in school tests. No attempt was made to require the teacher to estimate the boy "in comparison with other children of the same age."[1]

It is certain that the ordinary teacher *does not know* the age of his boys and, except in cases of the most obvious retardation or acceleration, will assume that they are at age for their class. In this connection it must be mentioned that the situation in most schools in the Panjab is different from that in the highly organized schools of California or other places in the West, in that the teachers in the lower classes are the most ill-trained and ill-paid of all. It is a very difficult matter to secure really intelligent co-operation in a testing experiment from this type of teacher. Needless to say, this does not by any means apply to all of the 35 schools visited by us, but it does certainly apply to a number of them.

Table XXVIII shows the correlations between H.I.Q.'s and teachers' estimates of intelligence by ages in the case of 774 boys. These correlations are not very different in amount from those of Table XXVII. Considering the variety of schools and teachers concerned, we are inclined to say that the total correlation of .26 may be almost as significant as the .48 reported by Terman for the children of California schools.[2]

The benefit of the doubt is with the test results rather than with the teachers' estimates.

[1] Cf. Terman, *The Stanford Revision of the Binet-Simon Scale*, p. 124.
[2] Cf. Terman, *Measurement of Intelligence*, p. 75.

TABLE XXVIII

CORRELATIONS OF H.I.Q.'S WITH TEACHERS' ESTIMATES OF INTELLIGENCE, BY AGE-GROUPS

AGE	NUMBER OF CASES	r	P.E. (FROM TABLE)
V	10	0	.1508
VI	38	.363	.0971
VII	68	.23	.0774
VIII	89	.326	.0614
IX	116	.362	.0614
X	98	.405	.0567
XI	102	.165	.0668
XII	106	.26	.0648
XIII	64	.35	.0734
XIV	48	—.83	.034
XV	30	.022	.1231
XVI	6	0	.1508
Total	774	.264	.0290

§ (33) Test Results and Social Status

It may be said that, from the orthodox Hindu point of view, the division into castes is the true division indicating social status. Such caste division would give us only three major groups—viz. Brahmins, non-Brahmin Hindus, and Depressed Classes. The Muhammadans would be entirely omitted, and the Sikhs would come in, so far as they have recognized any caste allegiance, as non-Brahmin Hindus. Of a total of 124 Sikhs, 46 simply state that they are " Sikhs," without the mention of any sub-caste.

It therefore seems desirable to throw all of our 929 boys into seven fairly distinct groups based upon the combined considerations of their caste, their fathers' occupations, and the financial position of their families, so far as these are indicated by their own replies to the examiners' questions. These seven groups will correspond, as nearly as any classification can, with the cultural environment constituted by the boys' own homes.

In describing their fathers' occupations, our boys reported 146 different types of business or profession. These have been placed under seven heads, ranking from A to G. In Table XXIX the division of these 146 occupations is indicated. The classification has been made after considerable consultation, and in all uncertain or ambiguous cases a boy's caste and school have also been taken into account in determining the probable social standing of his family. Thirty-six boys failed to report their fathers' occupation.

Several very inclusive headings appear, as, e.g. shopkeepers, zamindars (farmers), clerks, "service," tenants. Discretion has had to be exercised in all such cases in assigning these groups partially or wholly to particular ranks.

TABLE XXIX

Social Rank and Occupation

Showing Number of Occupations, and Number of Boys Assigned to Each

RANK A

Assistant Commissioner	1	"Leisure"	1
Barrister	3	Mill Agent	1
College Director	1	Mill Owner	1
Doctor	8	Persian Officer	1
Divisional Judge	1	Professor	7
Engineer	4	Sub-Divisional Officer	1
Headmaster	1	Sessions Judge	1
Inspector	2	Superintendent, D.C.V. Dept.	1
Jail Superintendent	1	Vakil	4
		Total	40

RANK B

Ass't. Sec'y. M.C.	1	"*Medical*"	4	*Trader*	12
Banker	10	Police Inspector	4	Timber Dealer	5
Bank Manager	2	*Railway Accountant*	3	*Vaid*	3
Cloth Merchant	22	Railway Inspector	2	Wine Contractor	1
Head Clerk	6	S.A. Surgeon	3	Zemindar	50
Headmaster	1	Teacher	5		
Hakim	3	Treasurer	3		
Landlord	4	Tea Merchant	1	Total	145

RANK C

Agent	1	Bookseller	2	Com's'n Agent	2
Broker	3	Clerk, Currency	1	Contractor	15

Cinema Manager	1	Nazir Com's. Off. ..	1	"Service" ..	39
Draughtsman ..	7	Overseer ..	5	Tahsildar ..	4
Daroga ..	1	Pensioner ..	5	Telegraph ..	1
Grain Dealer ..	6	Press Owner ..	2		
Library Assistant	2	Police Sub-Inspector	4		
Lawyer's Agent..	1	Priest ..	1		
News Manager ..	1	Saraf ..	2	Total	108

RANK D

Auctioneer ..	4	Ice Maker ..	1	Sugar Merchant ..	1
Agent, Court ..	3	Mohammedan Priest	5	Sikh Priest ..	1
Asst. Manager ..	1	Military Office ..	1	Shopkeeper ..	108
Army Off. Rnkr.	1	Money Lender ..	3	Subedar ..	1
Barrister's Mun...	1	Octroi Collector ..	3	Tenant ..	2
Bannia ..	1	Officer's Mun. ..	1	Teacher ..	10
Christian Priest ..	51	Priest ..	13	Tonga Inspector ..	1
Farmer ..	12	Patwari ..	3	Ziladar ..	1
Fruit Seller ..	1	Reader A.A.G. ..	1		
Goldsmith ..	12	Railway Guard ..	2		
Head Constable ..	1	Service ..	103		
Horse Dealer ..	2	Stationmaster ..	2	Total	353

RANK E

Confectioner ..	1	Leather Dealer ..	6	Tailor ..	10
Compounder ..	1	Motor Driver ..	1	Ticket Collector ..	2
Clerk, Shop ..	1	Milk Seller ..	3	Tenant ..	18
Clerk, Forest ..	1	Munshi ..	3	Vegetable Seller ..	1
Fortune Teller ..	3	Oil Seller ..	1	Writer Stamp Paper	1
Goods Clerk ..	1	Police ..	2	Wood Seller ..	5
Housefather ..	1	Railway Mail ..	1		
Hosp. Storekeeper	1	Rope Seller ..	1	Total ..	65

RANK F

Attendant ..	2	Farmer ..	26	Shoemaker ..	8
Barber ..	3	Halwai ..	1	Singer ..	3
Blacksmith ..	9	Kumhar (Potter) ..	1	Soldier ..	4
Chaprassi ..	3	Mason ..	4	Tenant ..	21
Carpenter ..	17	Mechanic ..	2	Watchmaker ..	1
Cook ..	12	Painter ..	1	Weaver ..	1
Dyer ..	1	Printer ..	3		
Engine Driver ..	2	Railway Workshop	4	Total ..	129

RANK G

Beggar ..	2	Leather Worker ..	15	Servant ..	1
Faqir ..	2	Labourer ..	16	Sweeper ..	14
Junk Dealer ..	1	Sadhu ..	2		
				Total ..	53

TOTAL OCCUPATIONS 146
TOTAL NO. OF BOYS REPORTING .. 893

Table XXX shows the distribution of 893 boys by Age and Social Status. In Table XXXI we have recorded the co-efficients of correlation between H.I.Q.'s (in groups of 10) and Social Status (7 ranks).

TABLE XXX

Distribution by Age and Social Rank

Ages	Ranks							Total
	A	B	C	D	E	F	G	
V	3	1	0	4	1	1	2	12
VI	2	4	3	24	2	9	5	49
VII	3	10	4	47	8	8	4	84
VIII	1	16	16	36	15	17	4	105
IX	8	16	19	48	9	19	9	128
X	4	11	23	46	7	10	9	113
XI	7	23	12	34	9	25	8	118
XII	6	22	13	44	9	13	10	117
XIII	3	12	10	30	1	14	2	72
XIV	2	15	4	24	4	6		55
XV	1	10	3	12		5		31
XVI		2	1	4		2		9
Total ..	40	145	108	353	65	129	53	893

TABLE XXXI

Correlation of H.I.Q. with Social Status by Age-Groups

Age	Total Number	No. Not Specified	Cases Correlated	r	P.E. (From Table)
V	13	1	12	.58	.1131
VI	50	1	49	.02	.1954
VII	87	3	84	.17	.0774
VIII	110	5	105	.15	.0648
IX	131	3	128	.27	.0614
X	119	6	113	.28	.0614
XI	124	6	118	.45	.0506
XII	126	9	117	.44	.0567
XIII	73	1	72	.26	.0734
XIV	56	1	55	.24	.0915
XV	31		31	−.19	.118
XVI	9		9	.17	.1448
Total ..	929	36	893	.26	.0194

It appears from Table XXXI that Age-groups V, VI, XV and XVI are inconclusive on account of the small number of cases. Of the other eight correlations, the highest, i.e. in Year XI, is .45. These figures represent a degree of correspondence that cannot be said to be high. The correlation for the total number of cases, regardless of age is .26. In the standardization of the Stanford scale the analogous correlation found was .40.[1]

While in every country the same factors doubtless tend to elevate intelligence into successful and prosperous life, with its attendant cultural and social advantages, there are some features of life in India which would seem to lessen the difference between classes in respect to the home environment of the child. Among these may be mentioned the very general illiteracy of the women of all classes; the virtual absence of books in the vernaculars for children and youths; and the lack of any facilities for kindergarten training. These conditions obtain to a large extent, regardless of social status, except perhaps in the large cities, and in the case of Indian parents who themselves have had an English education, and are affording similar advantages to their children. There are very few such among the boys we have examined. The caste idea seems also to have deprived children of one very important form of training, that of construction and hand-work. All trades and crafts are for the most part hereditary and exclusive. These facts, no doubt, have their bearing on the comparatively low correlation between H.I.Q. based upon test results and social status.

[1] Cf. Terman, *The Stanford Revision of the Binet-Simon Scale*, p. 93.

TABLE XXX

Distribution by Age and Social Rank

Ages	Ranks							Total
	A	B	C	D	E	F	G	
V	3	1	0	4	1	1	2	12
VI	2	4	3	24	2	9	5	49
VII	3	10	4	47	8	8	4	84
VIII	1	16	16	36	15	17	4	105
IX	8	16	19	48	9	19	9	128
X	4	14	23	46	7	10	9	113
XI	7	23	12	34	9	25	8	118
XII	6	22	13	44	9	13	10	117
XIII	3	12	10	30	1	14	2	72
XIV	2	15	4	24	4	6		55
XV	1	10	3	12		5		31
XVI		2	1	4		2		9
Total ..	40	145	108	353	65	129	53	893

TABLE XXXI

Correlation of H.I.Q. with Social Status by Age-Groups

Age	Total Number	No. Not Specified	Cases Correlated	r	P.E. (From Table)
V	13	1	12	.58	.1131
VI	50	1	49	.02	.1954
VII	87	3	84	.17	.0774
VIII	110	5	105	.15	.0648
IX	131	3	128	.27	.0614
X	119	6	113	.28	.0614
XI	124	6	118	.45	.0506
XII	126	9	117	.44	.0567
XIII	73	1	72	.26	.0734
XIV	56	1	55	.24	.0915
XV	31		31	−.19	.118
XVI	9		9	.17	.1448
Total ..	929	36	893	.26	.0194

It appears from Table XXXI that Age-groups V, VI, XV and XVI are inconclusive on account of the small number of cases. Of the other eight correlations, the highest, i.e. in Year XI, is .45. These figures represent a degree of correspondence that cannot be said to be high. The correlation for the total number of cases, regardless of age is .26. In the standardization of the Stanford scale the analogous correlation found was .40.[1]

While in every country the same factors doubtless tend to elevate intelligence into successful and prosperous life, with its attendant cultural and social advantages, there are some features of life in India which would seem to lessen the difference between classes in respect to the home environment of the child. Among these may be mentioned the very general illiteracy of the women of all classes; the virtual absence of books in the vernaculars for children and youths; and the lack of any facilities for kindergarten training. These conditions obtain to a large extent, regardless of social status, except perhaps in the large cities, and in the case of Indian parents who themselves have had an English education, and are affording similar advantages to their children. There are very few such among the boys we have examined. The caste idea seems also to have deprived children of one very important form of training, that of construction and hand-work. All trades and crafts are for the most part hereditary and exclusive. These facts, no doubt, have their bearing on the comparatively low correlation between H.I.Q. based upon test results and social status.

[1] Cf. Terman, *The Stanford Revision of the Binet-Simon Scale*, p. 93.

(G) THE RELIABILITY OF TEST RESULTS AS DETERMINED BY RE-EXAMINATIONS, AND BY CORRELATION OF SPLIT HALVES

§ (34) The Boys Re-examined

For purposes of re-examination, 167 boys at ages VII, IX and XI were chosen. These were taken from 22 of the 35 schools originally visited. Table XXXII exhibits the representative character of the selection.

TABLE XXXII

SHOWING BOYS SELECTED FOR RE-EXAMINATION

Orig. Age	Pres. Age	Cases			Expected Grade	No. At Age	No. Not At Age	Castes					Cases Elim'd
		12 Mos.	24 Mos.	Total				X	M	S	B	K	
VII	VIII	11			II-III	8	3						
	IX		26	37	III-IV	20	6	5	7	3	6 (1)	12	8
IX	X	13			IV-V	6	7						
	XI		46	59	V-VI	24	22	8	14	6	12	19	7
XI	XII	9			VI-VII	5	4						
	XIII		39	48	VII-VIII	20	19	12	10	8 (1)	5	13	8
Total		33	111	144		83	61	25	33	18	24	44	(23)
						144		144					

In Column 1 of the above table are shown the three age-groups in which these boys were at their original examination. In Column 2 are the six age-groups into which they fall at the time of the re-examination. Columns 3 and 4 show the number of boys at each age who were re-examined after 1-year and 2-year intervals respectively. The totals in Column 5 are exclusive of the 23 eliminated cases shown in the last column; 144 cases is the total number hereafter referred to, unless otherwise noted. In Columns 6, 7 and

8 the 144 cases are divided into those who are or are not at-age, i.e. who are or are not in the expected grades (Column 6) for their age. Columns 9-13 indicate the caste distribution of the three total groups of Column 5.

Cases Eliminated. Twenty-three of the 167 re-examined cases have been eliminated for the following reasons: (*a*) In eight cases an unusual discrepancy between the results is explained by the examiner's comments, "The boy was confused," "Frightened," "Nervous," "Embarrassed," "Was being watched." (*b*) In eight cases it was found that the examiner had omitted an undue number of tests, making scoring very uncertain. (*c*) In five other cases there was found to be faulty examining, either too rapid and careless, or apparently erratic. In one case the examiner's watch was not at hand. In one case the H.I.Q. was so high at the first examination (189), that what appears after a two-year interval to be an extreme drop, really indicates the inadequacy of the scale near the upper limit. Table XXXIII includes, however, a record of the correlation of original with re-test scores both before and after elimination. The correlation of "split-half" scores has been based upon all cases without elimination (cf. § 39).

§ (35) Correlation of Original Scores with Re-test Scores

Table XXXIII shows the correlations between the scores in the original examination, and at re-examination. These are given for each of the age-groups separately, both before and after the elimination of some uncertain cases; and also for cases examined after one-year and two-year intervals, and for the total number. The scores are taken by groups of five. The total correlation for 144 cases is .89 (P.E. .0128).

TABLE XXXIII

CORRELATION OF ORIGINAL WITH RE-TEST SCORES

GROUP	NUMBER OF CASES	r	P.E. (From Table)
VII Year (Complete)	45	.73	.0544
„ (8 Eliminated)	37	.83	.0384
IX Year (Complete)	66	.82	.0290
„ (7 Eliminated)	59	.865	.0265
XI Year (Complete)	56	.71	.0486
„ (8 Eliminated)	48	.87	.0265
Retested after One-Year Interval ..	33	.95	.0120
Retested after Two-Year Interval ..	111	.86	.0187
TOTAL CASES (without Elimination)..	167	.80	.0198
TOTAL CASES (Eliminating 23 Doubtful Results)	144	.89	.0128

NOTE

A number of investigators have reported the correlation between the I.Q. in the original test and in a re-test. The findings of nine such writers are summarized by Dickson:[1]

Stenquist	.72	(274 cases)
Rugg and Colloton ..	.84	(137 cases)
Terman	.93	(435 cases)
Baldwin	.72 to .93	(for various groups)
Gordon	.84	(44 cases)
Bobertag	.95	
Rosenow	.82	
	.85	(31 cases)
Cuneo and Terman ..	.94	(21 cases)
	.95	(25 cases)
	.88	(298 cases, 1 year's interval)
Garrison	.91	(127 cases, 2 years' interval)
	.83	(42 cases, 3 years' interval)

For purposes of comparison we may quote our analogous correlations for the groups of cases as given above:

[1] *Mental Tests and the Classroom Teacher*, p. 66.

VII Year ..	37 cases	Correlation	.70	P.E. .0544
IX " ..	59 "	"	.88	" .0265
XI " ..	48 "	"	.83	" .0343
One-Year Interval	33 "	"	.88	" .0342
Two-Year "	111 "	"	.83	" .0242
Total Cases	144 "	"	.83	" .0198

§ (36) H.I.Q. Differences at Re-examination

While the correlations reported in the previous section indicate a fairly high degree of correspondence between original test results and those of re-tests, they do not show to what extent the H.I.Q.s remain constant in the two cases.

Taking the 144 re-tested cases in the three age-groups and in the total, the median H.I.Q.s are as follows:

Age	Cases	Median H.I.Q. Original Exam.	Median H.I.Q. Re-Examination
VII	37	98	103
IX	59	115	122
XI	48	102	109
Total ..	144	108	115

It appears that as a general thing we have a considerable increase in H.I.Q. in the second examination. We may now undertake to analyse the H.I.Q. differences in the two examinations.

In Table XXXIV the differences in H.I.Q. between the first and second tests are shown:

(*a*) for the three original age-groups;
(*b*) for boys at age or not at age at the time of the second test;
(*c*) for school grades I-IV, and V-IX;
(*d*) for various combinations of examiners; and
(*e*) for the entire 144 cases.

TABLE XXXIV

H.I.Q. DIFFERENCES BETWEEN ORIGINAL EXAMINATION AND RE-EXAMINATION

GROUP	No. CASES	MED.	25%	75%	Q.	RANGE
A. Original Age-Groups:						
VII Year Group	37	+ 7	+ 12	− 1	7	+ 30 to − 30
IX Year Group	59	+ 8	+ 16	+ 1	9	+ 28 to − 23
XI Year Group	48	+ 6	+ 12	− 4	8.5	+ 26 to − 21
B. Boys At Age or Not At Age:						
At Age	83	+ 8	+ 16	− 1	9	+ 30 to − 30
Not At Age.. .. .	61	+ 6	+ 12	− 4	8.5	+ 27 to − 23
C. Primary and Higher Classes.						
I-V (Primary)	76	+ 7	+ 13.5	− 4.5	9.5	+ 30 to − 30
VI-IX (Middle)	68	+ 8	+ 14	− 5.5	10	+ 28 to − 23
D. Various Examiners:						
ML and RJ or v.v. . ..	64	+ 6	+ 12	− 1	7	+ 30 to − 11
CHR and MAK (orig.) ..	47	+ 7	+ 13	− 6	10	+ 25 to − 30
DDC, MSA, SD. . ..	34	+ 10.5	+ 19	+ 1	9	+ 23 to − 23
CHR, MAK, DDC, SD. ..	81	+ 8	+ 16	− 2	9.5	+ 28 to − 30
E. Total Number of Cases ..	144	+ 7.5	+ 14	− 1	8	+ 30 to − 30

An examination of Table XXXIV reveals the fact that on the whole there is an increase of 7.5 points in H.I.Q. in the re-test, the middle 50 per cent. of the differences falling between +14 and —1. It is impossible to assign either the absence of a higher general correlation, or the presence of this characteristic increase to any of the factors separately analysed in the first four parts of the table. The median differences, range of differences, middle 50 per cent. and Q., in all these four methods of grouping, remain practically the same.

In part D of the table, in which the various groupings of the examiners are shown, a significant fact comes to light. ML and RJ, who were also in all cases the examiners who conducted the re-tests, show a median difference of +6. These two examiners were the most experienced of all, and worked under most constant

supervision. DDC, MSA, and SD show a median difference of +10.5. The first of these was an experienced examiner, but worked for a longer period away from supervision. The other two were the least experienced of our examiners, and left the work during the first summer of the experiment. While the range of differences is much the same in the two cases, the amount of increase is greater in those cases in which the less experienced examiners conducted the first tests. In any case, the characteristic increase in H.I.Q. remains.

§ (37). Mental Age Differences in the Re-tests

The amount of this difference in the re-tests may be exhibited more fully in terms of mental age. In Table XXXV we have placed the re-examined cases in the three original year-groups, dividing each again into sub-groups of those tested after one-year and two-year intervals.

TABLE XXXV

SHOWING AGES AND MENTAL AGES IN MONTHS, AT FIRST TEST AND AT RE-TEST, BY YEAR-GROUPS; AND INTERVALS BETWEEN TESTS

YEAR-GROUP AT FIRST TEST	NUMBER OF CASES	AVERAGE CHRONOLOGICAL AGE		AVERAGE MENTAL AGE		AVERAGE INTERVAL BETWEEN TESTS	AVERAGE INCREASE IN MENTAL AGE	EXCESS OF M.A. INCREASE OVER C.A. INCREASE
		FIRST TEST	RE-TEST	FIRST TEST	RE-TEST			
VII ..	12	87	100	81	101	13	20	7
" ..	23	90	111	96	124	21	28	7
IX ..	18	110	126	111	137	16	26	10
" ..	41	114	136	135	172	22	37	15
XI ..	13	135	150	148	170	15	22	7
" ..	35	138	160	142	177	22	35	13
TOTAL ..	142							

In this table the total number of cases shown is 142.[1]

In Cols. 3, 4, and 7 the average age at the first test and at the re-test, and the average interval between the tests, are shown. Similarly, in Cols. 5, 6, and 8, the average mental age at the first test and at the re-test, and the average increase in mental age are given. The last column shows the average amount by which the M.A. differences in the two tests exceed the differences in chronological age. This excess amounts to not less than a half-year in any group, and in two groups to more than a year of mental age.

The correlation between the scores in the two tests indicates that the scale is giving us a dependable relative estimate of the boys examined. The characteristic increase in H.I.Q., on the other hand, seems to show that some factors of practice or coaching are at work. The two examiners who conducted the re-tests reported, before they had made any study of the results or any comparison with the original scores, that they *felt* that the boys were familiar with the test situation and remembered various items of test material. As a matter of fact, there had been no printed version of the tests in circulation before the re-tests were made, and there could have been no actual repetition or practice of the tests. Even so, we cannot rule out the element of familiarity, and, in that sense, of "practice." The possibility of coaching introduces a factor upon which a more extended comment seems in place.

§ (38) A Note on Coaching and Practice

It must be said that we have been working under much more difficulty in this regard than seems to be

[1] Two cases, one of VI years and one of XII years in the original examination, are omitted. Elsewhere these are included with the VII and XI year groups respectively. Cf. Table XXXII, parenthetical figures in Cols. 11 and 12.

experienced in Western countries. The only safeguard commonly suggested in the West is some alternative form of a test in order to nullify any possible coaching of one pupil by another. And for the most part these alternative forms have only been available in the case of group tests. There is little indication that experimenters have had to keep the tests out of the hands of teachers, or to take precautions lest parents or teachers might coach up their own children in order to assure their passing high in the examination.

In India we are under the regime of the *Examination*. All grades, honours, degrees, posts, promotions, salaries, are determined and secured by examination results, from the beginning of a child's school career to his entry into a business or profession, or into Government service. The parents' ambition is that the child should *pass*. The teacher's success depends on his ability to prepare his pupils to *pass*. The passing of examinations has become a ruling motive throughout. As a result, the mental test is likely to be conceived of as only another in the long series of ordeals for which the child must prepare, and on the basis of which his teacher will be judged. And when it is remembered that in India the primary and lower grade teachers are as yet men of comparatively little education and training themselves, it will be recognized that it is a peculiarly difficult matter to enlist the intelligent and honest co-operation of all the teachers in a school in an experiment of this kind; or to make them understand that there is such a thing as an examination which has only a cold and scientific purpose, and which is not in some way designed to affect their own good standing as successful teachers.

While we cannot speak too highly of the generous reception accorded to us by headmasters and teachers

almost without exception, and of their interest and assistance during the administration of the tests, there are three or four special features of our experience which tended to introduce difficulty and which must be mentioned. In the first place, there was the unusual curiosity attending this new and mysterious form of examination. This curiosity was devouring boys and teachers alike. In some cases it was necessary to scatter a crowd of peering boys from outside window or door. In other cases teachers would try to listen in, or give assistance to a boy, and the case in question would have to be discarded. In one case it was noted that the boy had a beautiful spiral path well under way long before the examiner had completed his explanation of the Ball and Field problem. As far as could be, all these possibilities of coaching were prevented.

Another feature noted was communal zeal. We are now passing through a period of deep rivalry between religious communities in India. Many of the schools visited are communal schools, conducted by Muhammadan or Sikh or orthodox Hindu or Arya Samajist or Christian people for the boys of their own communities. While every precaution was taken to select boys as representative of the population as possible, it appeared that in communal schools there was a special desire and attempt to put forward the best boys in order that the community might stand well in comparison with other communities. There is hardly any communal school where this desire will not be met with. The Muhammadans are keen to disprove the often-repeated statement that Hindus are more brainy. The Sikhs are in the midst of a "national" revival, and are jealous of their claims to leadership. The orthodox Hindu school has Brahmin prestige to maintain. The village school

for Christian boys from the Depressed Classes feels the stigma that has attached to the untouchables, and would remove it. This is a constant feature of mental examinations in our schools at this stage, and it has to be countered at every point.

All these facts suggest that in an atmosphere full of a kind of examination-fever, it is very likely that at some point, between the boys themselves or between boys and their ambitious teachers, there may be conversations and discussions and hints which amount to coaching.

It is also indicated that we need for purposes of re-testing some highly dependable alternative instrument, which might bear to our scale a relation similar to that of the Herring Revision of the Binet-Simon Tests[1] with the Stanford Revision.

§ (39) Reliability by Split Half Correlation

It is a current practice to estimate reliability in terms of the correlation of two random halves of an examination. Strictly the tests should be so divided that the "split halves" would contain equated portions of test items. We have undertaken to secure co-efficients of reliability on these lines for six groups. The single tests of the scale have not been split, but the 35 tests have been paired in such a way as to divide the total point score equally, *and to give an approximate equivalence between the tests* assigned to the two halves. The division was suggested by Dr. S. C. Dodd,[2] and is as follows:

[1] Herring, John P., *The Herring Revision of the Binet-Simon Tests*, World Book Co., Yonkers on Hudson, N.Y., 1923.

[2] Dodd, Stuart C., *International Group Mental Tests*, Princeton, 1926, p. 88.

Brief Scale				Residue of Point Scale			
Odd Test	Points	Even Test	Points	Odd Test	Points	Even Test	Points
1	10	3	9	11	1	12	1
2	4	4	6	13	3	14	4
5	12	6	10	15	3	16	2
7	6	10	6	17	8	18	5
8	9	9	10	19	1	20	1
				21	3	22	5
B.S.	41		41	23.25	1.3	24	4
				27	5	26	4
				29	5	28	6
				31	4	30	3
				33	3	32	6
				34	4	35	3
				R.P.S.	44		44
				Total	85		85

The correlations found by this method are these:

Age	No. of Cases Re-tested	Original Cases	New Cases not Previously Reported	Total Cases	r	P.E.
VII ..	43				.83	.029
IX ..	66				.26	.077
XI ..	56				.81	.034
XII ..		126			.82	.024
XII ..			206		.66	.031
XII ..				332	.73	.017

PART III

THE INTELLIGENCE OF THE "DEPRESSED CLASSES" IN THE PANJAB

(A) TEST RESULTS OF TOTAL NUMBER OF BOYS EXAMINED; SIX CASTE GROUPS

§ (40) The Six Caste Groups

We have already referred to the six "caste" divisions in which our boys are placed (cf. § 15 and § 17) and have shown, in Table VII, to what extent our percentage of boys in these various divisions agrees with the general school population. We have also indicated in what sense they are called *castes* and how far they are culturally distinct groups. From Table VI, § 17, it will be seen that we have sufficient numbers for purposes of adequate comparison in all six caste groups at the four ages, IX to XII, and in the five major groups at ten ages, VI to XV.

As has already been intimated, the generally accepted distinction between these classes is this: (*a*) the Brahmins, (B), contain in purest strain the racial and intellectual aristocracy of the Hindus; (*b*) the non-Brahmin Hindus, (K), are the great middle classes; (*c*) the Sikhs, (S), correspond to (K) in racial strain, but are predominantly agricultural, and have their own characteristic religious culture; (*d*) the Muhammadans, (M), represent all shades of racial origin, but a distinct linguistic and religious culture, and, while in number they are slightly in the majority, they are as yet educa-

tionally backward; (*e*) the Chuhras, (C), are the sweeper-caste (outcaste) of the Hindus, are regarded as untouchable, and live in separate quarters in cities and villages; and (*f*) the Christians of our tests, (X), are of Chuhra origin, but have had the advantage of school and church (cf. § 15).

Schools for boys of the Depressed Classes other than village Christians are few and far between as yet. Christian missionary societies are hard put to it to afford education even for the many village Christians for whom they have become responsible. Other societies are only beginning to take up this work to any great extent. As a result, our number of boys classified properly as Chuhras is very small. One school for the Depressed Classes conducted by a Hindu society, the Arya Samaj, in which we tested some Chuhra boys, was not in existence two years later, when we returned hoping to re-test the same boys.

Of Christian boys we have a large number, 170. These boys have had the opportunity of attending schools which are, on the whole, first class, and which provide the same general curriculum of study as is offered in all recognized schools. They are all of Chuhra origin so far as the stock is concerned, and comprise the major group which we have taken as representative of the "Depressed Classes" or "outcastes." We have to recognize, however, the selective process which has operated, in the first instance, in the conversion of their parents or grandparents; in the second instance, in the removal of parental illiteracy in the case of 87 of them (cf. pp. 86ff.); and, finally, in their being sent to school at all. We cannot claim that our group is a random sample of all the outcastes of the Panjab. It may rather be regarded as a sample of the upper half of

the Depressed Classes. Whatever evidence of talent we find in this group is significant, but it remains for future investigation to determine the degree in which it is shared by the entire Chuhra caste.

§ (41) Sub-Castes

The six castes are further divided into sub-castes. Table XXXVI shows the 124 sub-castes reported by the boys themselves to the examiners. If we omit the 170 Christians, 17 Muhammadans, 70 Sikhs, 126 Brahmins, and 135 Khatris who do not specify their sub-caste, we find that these 124 sub-castes have really been reported by only 411 of our boys. A complete report from all the 929 boys must have shown a considerably larger number. The sub-castes are clans or families, usually maintained in much purity by strict regulation of intermarriage. They are shown here as a further indication of the representative character of our selection.

TABLE XXXVI

SUB-CASTES REPORTED BY 411 BOYS

CHUHRAS

1. Barber	1	3. Sweeper	18
2. Chamar..	15	4. Tailor	1
		Total	35

MUHAMMADANS

1. Afghan	7	13. Kakazai ..	4	25. Rajput (Kakazai)	2
2. Butt	2	14. Kashmiri ..	8	26. Rajput ..	27
3. Bhatti ..	2	15. Mirasi ..	3	27. Sheikh ..	28
4. Chughtai ..	1	16. Manhas ..	1	28. Sheikh (Wain)	18
5. Carpenter ..	1	17. Mughal ..	1	29. Syed	14
6. Faqir ...	1	18. Mirzai ..	1	30. Sheikh (Raj) ..	10
7. Gujjar ..	1	19. Mochi ..	1	31. Saini.. ..	3
8. Goldsmith ..	1	20. Pathan ..	1	32. Tailor ..	5
9. Ironsmith ..	5	21. Quereshi ..	6	33. Wain ..	1
10. Jat	12	22. Qazilbash ..	1	("Mohds" 17)	
11. Khoja ..	7	23. Qazi	1		
12. Kanegar ..	1	24. Raula Rawal ..	2	Total	168

SIKHS

1. Akali ..	1	4. Batra ..	2	7. Bhatia ..	1
2. Ahluwalia ..	4	5. Bani	1	8. Bedi	1
3. Arora ..	5	6. Bhatt ..	1	9. Dhamo ..	1

10. Duka	.. 1	14. Khosla	.. 1	18. Rajput	.. 2		
11. Jaini ..	.. 3	15. Lamba	.. 1	19. Ramgharia	.. 7		
12. Jat ..	.. 15	16. Mohra	.. 1	20. Warghan	.. 1		
13. Khatri	.. 4	17. Nayar	.. 1	("Sikh" 70)			
					Total 54		

BRAHMINS

1. Bhardwaj	.. 3	9. Kashmiri Pt.	.. 3	17. Retan	.. 1		
2. Bhargawa	.. 1	10. Kale ..	.. 1	18. Shukal	.. 1		
3. Chibba	.. 1	11. "Kantnaich"	.. 1	19. Sharma	.. 1		
4. Degan	.. 1	12. Kalia	.. 1	20. Sachdev	.. 1		
5. Dutt ..	.. 1	13. Lawa	.. 1	21. Sud ..	.. 1		
6. Fakru	.. 1	14. Mehra	.. 1	22. Wannan	.. 1		
7. Gupta	.. 1	15. Nagon	.. 1	("Brahmin" 126)			
8. Jhingan	.. 1	16. Pattok	.. 1		Total 26		

NON-BRAHMIN HINDUS

1. Aggarwal	.. 5	17. Jhaukot	.. 1	33. Nanda	.. 3		
2. Arora	.. 41	18. Kapur	.. 11	34. Purbai	.. 1		
3. Bahl ..	.. 1	19. Khanna	.. 5	35. Rajput	.. 3		
4. Barber	.. 1	20. Kalra	.. 1	36. Sochde	.. 1		
5. Beri ..	.. 2	21. Khakhar	.. 1	37. Sekhri	.. 1		
6. Blacksmith	.. 1	22. Kumhar	.. 1	38. Sohni	.. 2		
7. Bhatia	.. 1	23. Kochhar	.. 1	39. Sughal	.. 1		
8. Bhargawa	.. 1	24. Kaisth	.. 3	40. Suri ..	.. 2		
9. Baniya	.. 3	25. Mahajan	.. 1	41. Seth ..	.. 2		
10. Chugh	.. 1	26. Mehra	.. 1	42. Sadhu	.. 1		
11. Chopra	.. 3	27. Moongi	.. 2	43. Tandon	.. 1		
12. Chaddah	.. 1	28. Malhotra	.. 4	44. Udasi	.. 1		
13. Dhingra	.. 1	29. Nayar	.. 1	45. Wadh	.. 2		
14. Goldsmith	.. 1	30. Namwanti	.. 1	("Khatri" 135)			
15. Gujjar	.. 1	31. Nanda	.. 3		Total 128		
16. Jat ..	.. 5	32. Narula	.. 1				
					GRAND TOTAL 411		

It will be noted that in the above list of "sub-castes" there appear miscellaneous crafts or occupational designations, geographical designations, designations of national origin, and clan-names proper, just as they were reported by the boys.

§ (42) Distribution of Point Scores by Castes in Year-Groups

Turning to the test records, we find first of all, Table XXXVII, that there are some notable differences in scores made by the six caste groups at the various age levels. Only the seven year-groups, VII to XIII, are given here, as the number of boys in the other five

groups is too small to afford completely satisfactory comparisons. Even in these seven years the numbers are not large enough to give comparative values with finality. The first figure in each square of the table shows the number of boys of the caste and age indicated. The middle figure in each square is the median score, and the lower figure the semi-inter-quartile range (Q.), for the group. These medians and measures of scattering may be compared with each other and with the same measures of the total age-groups, which are given in the last column.

TABLE XXXVII

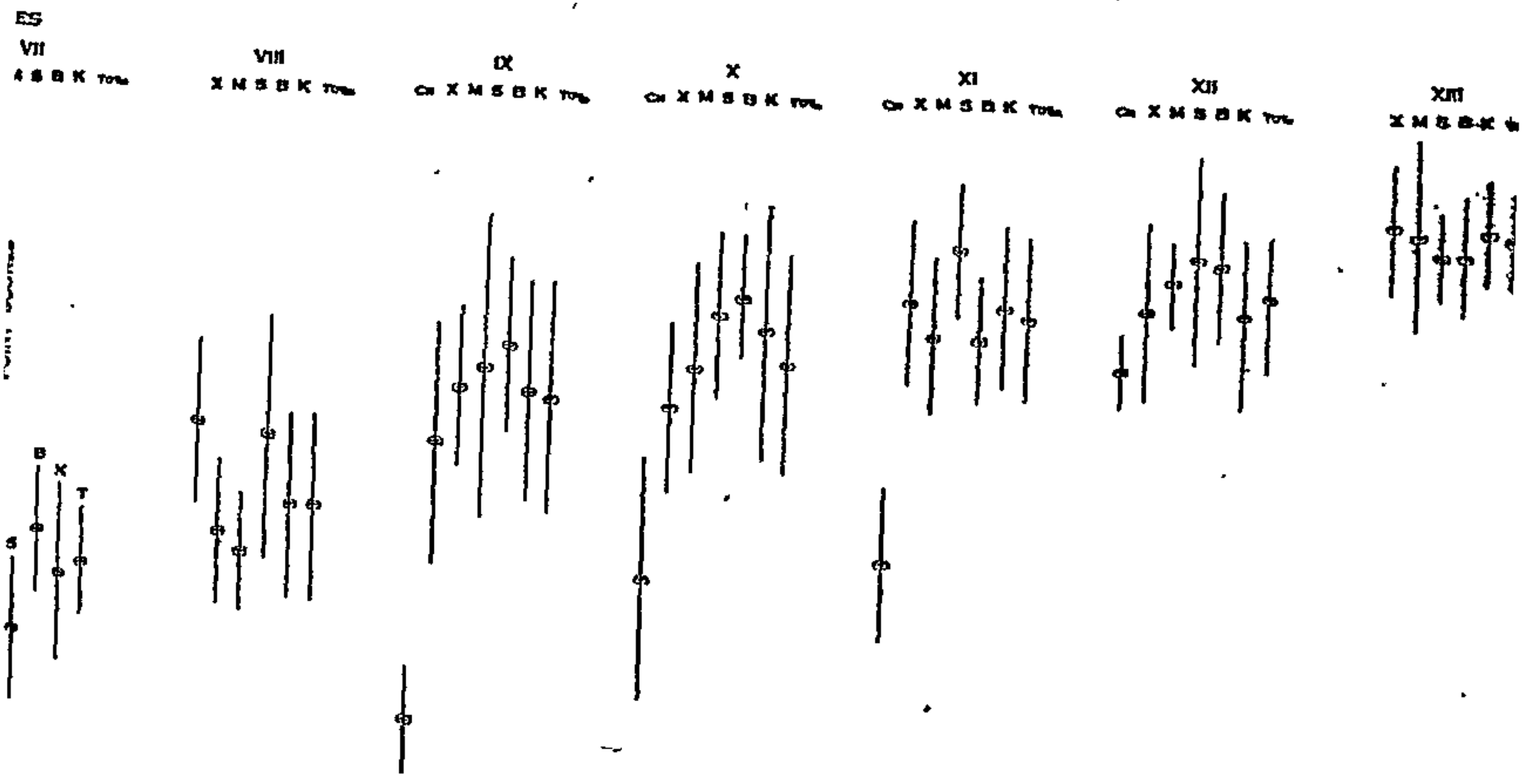
MEDIAN POINT SCORES BY CASTES AND AGES

AGE	CHUHRAS			CHRISTIANS			MUHAMMADANS			SIKHS			BRAHMINS			NON-BRAHMIN HINDUS			TOTAL		
	No.	Med.	Q.	No.	Med.	Q.	No.	Med.	Q.	No.	Med.	Q.	No.	Med.	Q.	No.	Med.	Q.	No.	Med.	Q.
VII ..				12	57	16	21	53	10	11	41	12	11	58	10.5	32	51	15	87	53	9
VIII ..				17	78	14.5	24	59	12	11	56	9.5	18	76	21	39	64	15.5	110	64	15.5
IX ..	8	28.5	9.5	20	76	21	26	85.5	14	15	89	26	24	93	15	41	85	19	131	84	20
X ..	7	54	20.5	21	83	14.5	22	90	18	16	99	14	19	102	11	34	97	22	119	91	19
XI ..	8	58	13	23	102.5	14	27	97	13.5	18	111.5	11.5	18	96.5	11	30	102	13.5	124	100	14
XII ..	9	92	6.5	24	102	15	25	107	7.5	15	111	17.5	17	110	12.5	36	102	16	126	105	12.5
XIII ..				16	117.5	11	11	116	16	15	113	7.5	14	113	10	16	117	0	73	116	8

It appears, first of all, that the Chuhras, of whom we have but a very few, are far and away outclassed by all the rest in the matter of passing tests. Their schooling has been very casual. It is really most unusual to find any schools for this class of boys. Less than one per cent. of the population classified as Depressed Classes in the census are to be found in schools. Most of our Chuhra boys were studying in a school which had been opened by a zealous reform party, but which has since disappeared. Our 35 Chuhra boys average more than two school grades below the expected grade for their age. Only 4 have advanced as far as the fourth primary class. This does not imply that they have fallen back year by year. It is more likely that they started very late in a newly opened and not highly organized school. They cannot rightly be said to belong to the same environment as has been provided for other classes by the recognized school system. We can assert this with the more assurance as our next group of Christian boys, who are of the same stock and parentage but have been attending first-class schools, make a very good comparative showing.

Examining the median scores made by the Christian boys, we find that they, with the Brahmins, score from 4 to 16 points more than others at age VII, and from 12 to 20 points more at age VIII, the Christians scoring 4 and 14 points at the same respective ages above the medians for the entire year-groups. At ages IX and X the Christian medians fall below others by 7 to 19 points, and below the total by 8 points. At age XI they are slightly above average, but fall much below the Sikhs, who here, and at XII, score highest. At XII they fall below all but the non-Brahmin Hindus, but at XIII, with them, they again exceed the total median.

FIG. XXXVIII. RANGE OF MIDDLE 50% OF POINT SCORES BY CASTES AND AGES.



The same facts are brought out in Figure XXXVIII, in which the range of the middle 50 per cent. of the scores made by each caste year-group and by each total year-group are shown graphically.

This comparison of scores by age-groups does not give adequate basis for drawing final conclusions. We are dealing with small groups, varying in size, and have not equated the ages within the groups. We have noted, however, that our Christian group has exceeded other groups at two ages; has fallen below others at two ages; at one age has shared the lowest place with one other group; and at two ages has, though not exceeding all, at least exceeded the average of all others. These indications lead us to anticipate that in the Christian boys from the Depressed Classes we are not dealing with a necessarily inferior mentality.

§ (43) Distribution of Non-Verbal Scores by Castes

In the same way we may examine the non-verbal test records:

TABLE XXXIX

MEDIAN NON-VERBAL SCORES BY CASTES, IN YEAR-GROUPS

AGE	CASTES							TOTAL NO. CHRISTIANS	NO. CHRISTIANS EQUAL OR EXCEED TOTAL MEDS.	PER CENT. CHRISTIANS EQUAL OR EXCEED TOTAL MEDS.
	C	X	M	S	B	K	TOTAL			
VII ..		17.5	15	12	15	13.5	15	12	7	58
VIII ..	7	19	17	17	16	17	17	17	10	59
IX ..	7.5	19.5	20	22	23	20	20	20	10	50
X ..	14	22	22.5	24	24	23	23	21	9	43
XI ..	15	23	23	25	23.5	24.5	24	23	11	48
XII ..	22	22.5	25	24	27	26	25	24	10	42
XIII ..	24	28	26	27	27	26	26	16	11	69
XIV ..		26	26	30	30	28	28	19	8	42

Again the Chuhras are badly outclassed, but as they advance in age and in school their handicap decreases.

At ages VIII and IX they are making only average five-year scores, but at XII and XIII their scores are equal to the general medians for only two years younger.

The median non-verbal score for the Christian group is relatively highest at ages VII, VIII and XIII, as noted in the total point scores.

If the non-verbal tests can be regarded as in any way bringing out "practical aptitude" as distinct from a purely intellectual capacity, the Brahmins do not fall short here, as in accordance with a popular idea they might be expected to do. In fact, in five of the eight years here shown, and in three of the four not shown in this table, the Brahmins exceed the median non-verbal scores of all castes taken together. The Sikhs, who are popularly supposed to be manually most apt, show no superiority up to age VIII, and beyond that are in no age unequalled by some other group.

In the final columns of the table the numbers and percentages of Christians equalling or excelling the medians of the whole age-groups are shown. Although these non-verbal tests are not tests of mechanical ingenuity, or of fitness for the practical struggle of life, nevertheless the comparative showing made by our boys from the Depressed Classes again gives us reason for expecting them to give a very good account of themselves in a fair and equal competition with other classes.

§ (44) Distribution of H.I.Q.s by Castes

In the above comparisons of Point scores all the boys are assumed to be of average age for their year-groups. We may now examine the distribution of H.I.Q.s by castes. In these measures each boy's actual age comes into play in determining the amount of his H.I.Q. In

The same facts are brought out in Figure XXXVIII, in which the range of the middle 50 per cent. of the scores made by each caste year-group and by each total year-group are shown graphically.

This comparison of scores by age-groups does not give adequate basis for drawing final conclusions. We are dealing with small groups, varying in size, and have not equated the ages within the groups. We have noted, however, that our Christian group has exceeded other groups at two ages; has fallen below others at two ages; at one age has shared the lowest place with one other group; and at two ages has, though not exceeding all, at least exceeded the average of all others. These indications lead us to anticipate that in the Christian boys from the Depressed Classes we are not dealing with a necessarily inferior mentality.

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	C	X	M	S	B	K	TOTAL			
VII ..		17.5	15	12	15	13.5	15	12	7	58
VIII ..	7	19	17	17	16	17	17	17	10	59
IX ..	7.5	19.5	20	22	23	20	20	20	10	50
X ..	14	22	22.5	24	24	23	23	21	9	43
XI ..	15	23	23	25	23.5	24.5	24	23	11	48
XII ..	22	22.5	25	24	27	26	25	24	10	42
XIII ..	24	28	26	27	27	26	26	16	11	69
XIV ..		26	26	30	30	28	28*	19	8	42

Again the Chuhras are badly outclassed, but as they advance in age and in school their handicap decreases.

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If the non-verbal tests can be regarded as in any way bringing out "practical aptitude" as distinct from a purely intellectual capacity, the Brahmins do not fall short here, as in accordance with a popular idea they might be expected to do. In fact, in five of the eight years here shown, and in three of the four not shown in this table, the Brahmins exceed the median non-verbal scores of all castes taken together. The Sikhs, who are popularly supposed to be manually most apt, show no superiority up to age VIII, and beyond that are in no age unequalled by some other group.

In the final columns of the table the numbers and percentages of Christians equalling or excelling the medians of the whole age-groups are shown. Although these non-verbal tests are not tests of mechanical ingenuity, or of fitness for the practical struggle of life, nevertheless the comparative showing made by our boys from the Depressed Classes again gives us reason for expecting them to give a very good account of themselves in a fair and equal competition with other classes.

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In the above comparisons of Point scores all the boys are assumed to be of average age for their year-groups. We may now examine the distribution of H.I.Q.s by castes. In these measures each boy's actual age comes into play in determining the amount of his H.I.Q. In

Table XL is shown the distribution of H.I.Q.s in groups of five, by castes, and in the total. At the foot of the table medians, quartiles and Q.s are also given.

TABLE XL

DISTRIBUTION OF H.I.Q.S BY CASTES IN GROUPS OF FIVE, WITH MEDIANS

H.I.Q.s	C (35)	X (170)	M (185)	S (124)	B (152)	K (263)	TOTAL (929)
45–9			1				1
50–4	4			1	3	1	9
55–9	4				3	1	8
60–4	5	5	3		1	2	16
65–9	3	3	3	3	3	7	22
70–4	4	8	8	1	3	8	32
75–9	2	12	8	6	6	19	53
80–4	5	10	11	8	3	15	52
85–9	2	20	18	10	5	25	80
90–4	2	14	18	19	9	20	82
95–9	2	13	18	12	17	27	89
100–4	1	13	16	8	16	19	73
105–9		15	19	8	14	21	77
110–4		15	15	14	12	16	72
115–9		14	9	4	15	19	61
120–4		12	7	8	16	11	54
125–9		4	10	6	9	15	44
130–4	1	3	6	3	4	10	27
135–9		3	6	3	4	5	21
140–4		3	3	4	7	2	19
145–9			3			3	6
150–4		2		3	1	5	11
155–9		1	1			2	4
160–4			2	1	1	3	7
165–9				2		1	3
170–4						2	2
175–9						2	2
180–4							
185–9						2	2
MEDIAN	73 .	99.5	101	101.5	107	101	101
25% ile	62	86	87	90	90.5	87	89
75% ile	87	114	120	117	123	119	117
Q.	12.5	14	16.5	13.5	16	16	14

The Brahmins' median H.I.Q. is 107; the Chuhras', 73; Muhammadans, Sikhs and non-Brahmin Hindus are

FIG. XLI DISTRIBUTION OF HIQ'S BY CASTES

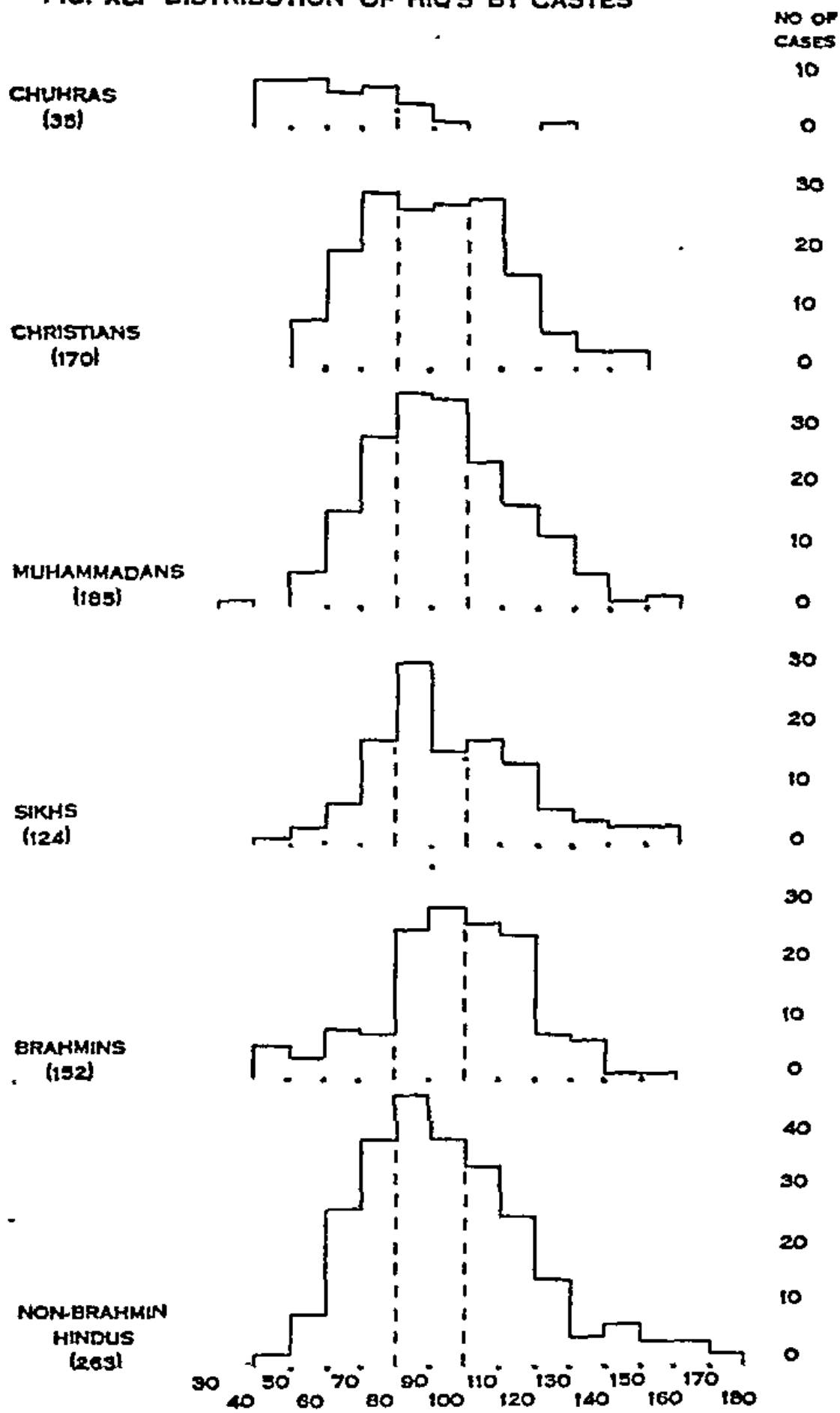
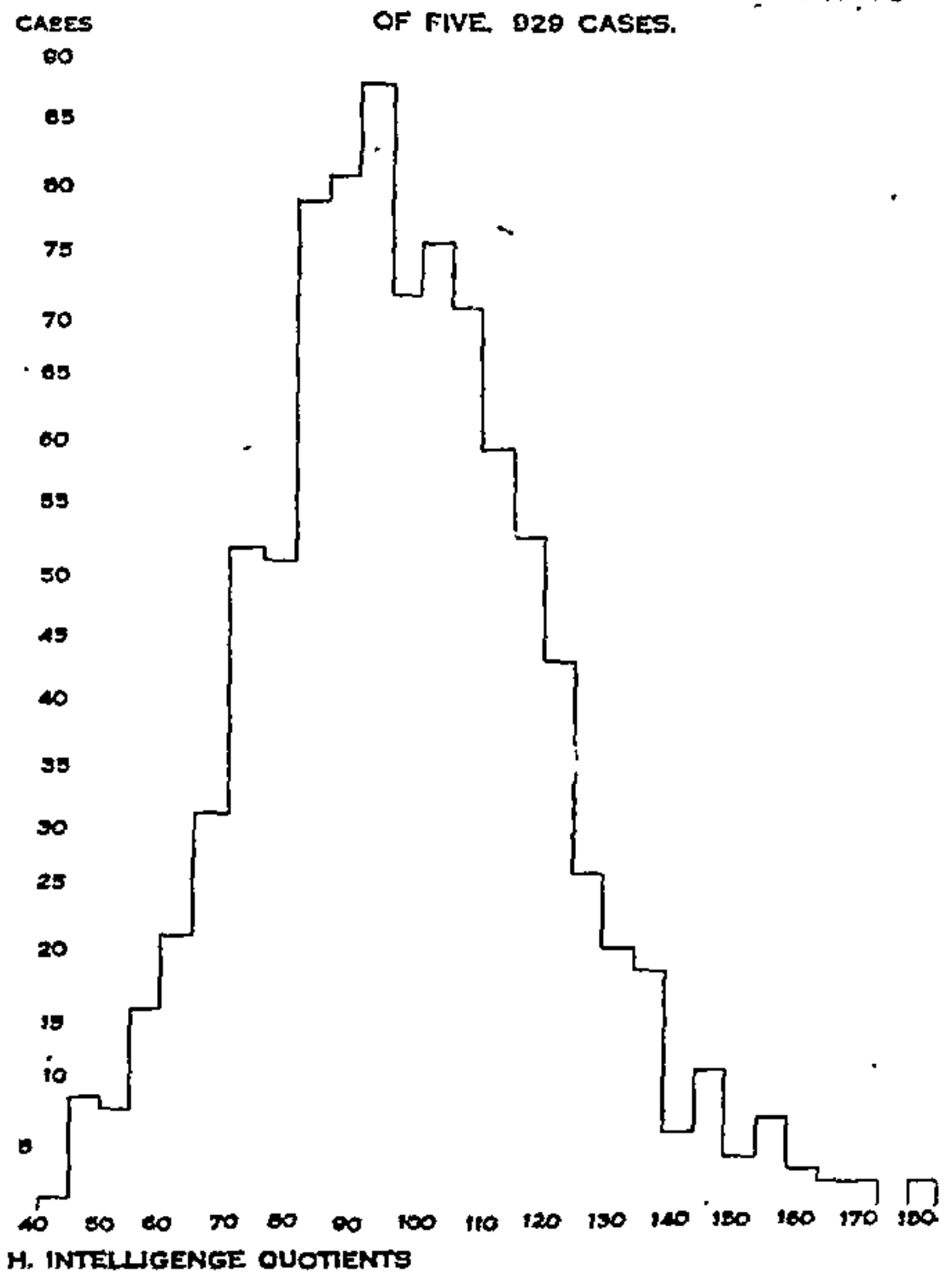


FIGURE XLII. TOTAL DISTRIBUTION OF IQ'S IN GROUPS OF FIVE. 929 CASES.



almost exactly the same at 101; the Christians are 99.5; while the median of the total distribution is 101.

In Figure XLI we have illustrated these several distributions, and in Figure XLII the total distribution of

H.I.Q.s. In the first the H.I.Q.s are grouped by tens, thus: 80–89, 90–99, 100–109, etc.; in the second they are grouped by fives, as in Table XL. The dotted lines in each case enclose all H.I.Q.s from 90 to 109 inclusive. The comparative size of the groups and the character of the scattering may be observed. It may be noted that, while the five major groups are all considerable in number, the K's are more than twice as numerous as the S's. The group of Chuhras falls much below the major distribution of the other castes, the size of the group being too small to be adequately comparable with the rest.

§ (45) The Overlapping of the Caste Groups

TABLE XLIII

THE H.I.Q. OVERLAPPING OF THE CASTE GROUPS

NUMBER AND PER CENT OF	TOTAL NO.	WHO EQUAL OR EXCEED THE MEDIANS OF							
		(Meds.)	C (73)	X (99.5)	M (101)	S (101.5)	B (107)	K (101)	TOTAL (101)
C ..	35	No.	18	2	2	2	1	2	2
		%	51.5	5.7	5.7	5.7	2.9	5.7	5.7
X ..	170	No.	154	89	80	80	65	80	80
		%	90.5	52.3	47	47	38.2	47	47
M ..	185	No.	174	102	94	94	75	94	94
		%	94	55.2	50.8	50.8	40 6	50.8	50.8
S ..	124	No.	120	64	63	63	53	63	63
		%	96.8	51.6	50.8	50.8	42.7	50.8	50.8
B ..	152	No.	140	100	96	96	79	96	96
		%	92.1	68.5	63.2	63.2	52	63.2	63.2
K ..	263	No.	249	144	134	134	110	134	134
		%	94.7	54.8	51	51	41.8	51	51

We may now examine the amount of overlapping in the various caste groups. In Table XLIII are shown

the numbers and percentages of the caste groups (on the left) who equal or exceed the medians of the groups as given at the top of the table. Reading from left to right, we may proceed as follows (taking line 3, for example): Of Muhammadans, of whom there are a total of 185, 174, or 94 per cent., equal or exceed the median of the Chuhras (73); 102, or 55.2 per cent., equal or exceed the median of the Christians (99.5); 94, or 50.8 per cent., equal or exceed their own median (101); etc.

By the above table a considerable superiority of the Brahmin group in test results, the virtual equality of the other non-Christian caste groups (omitting the Chuhras), and a slight inferiority of the Christian group are suggested.

Attention is drawn, however, to the horizontal line opposite the letter X. Omitting the first two vertical columns, the figures here are to be read: Of the 170 Christian boys, 80, or 47 per cent., equal or exceed the medians of the Muhammadans, Sikhs and non-Brahmin Hindus, while 65, or 38.2 per cent., equal or exceed the median of the Brahmins. These figures contain a significant commentary on the capacity of this group. That the group should, on the average, prove to be 1.5 points less in H.I.Q. than the general population would seem to corroborate in a slight degree the common belief that they are inferior. The amount and significance of this difference would have to be determined, and there are statistical methods quite adequate to this task (cf. § 52, p. 182). But even if we take these figures at their face value, the fact that 80 out of 170, or 47 per cent., of these boys should, age for age, prove equal to, or better than, the median of the whole population in the capacities required to pass these tests, is indicative of a

degree of mentality which cannot rightly be stigmatized as hopelessly inferior.

§ (46) Correlations of Point Scores and Non-Verbal Scores by Castes

Table XLIV shows the correlations between non-verbal scores and point scores, by castes.

TABLE XLIV

SHOWING CORRELATIONS OF NON-VERBAL SCORES WITH POINT SCORES, BY CASTES. (ALL AGES.)

CASTE	NO. OF BOYS	r	P.E. (FROM TABLE)
C	35	.90	.0234
X	170	.87	.0153
M	185	.91	.0105
S	124	.93	.0128
B	152	.92	.0105
K	263	.90	.0081
TOTAL ..	929	.91	.0057

(B) TEST RESULTS OF 500 SELECTED BOYS; FIVE CASTE GROUPS

§ (47) Special Experimental Group of 500 Boys

The comparisons made hitherto between boys of our six caste groups are based on what appear to be an adequate and representative selection from these classes as found in the schools. It is to be noticed, however, that the groups differ considerably in size, and in the proportionate number of boys located in the various school grades. In has been thought well to choose a group of approximately 50 from each caste, who shall correspond, as exactly as possible, boy for boy, in age and in school progress. A second group, containing 50 from each

caste, have been selected who correspond equally precisely in age, but who fall wherever they may in the school grades. Omitting entirely the Chuhras, who are too few to enter into this scheme of comparison, we have now chosen 500 of our 929 boys, 100 in each of the five caste groups. These should afford us very instructive comparisons.

TABLE XLV

SHOWING BOYS SELECTED FOR SPECIAL EXPERIMENTAL GROUP OF 500

AGE	NUMBER OF BOYS EQUAL IN AGE-GRADE	NUMBER OF BOYS EQUAL IN AGE, BUT NOT IN GRADE	TOTAL NUMBER IN EACH CASTE	TOTAL NUMBER IN FIVE CASTES
VII ..	7	4	11	55
VIII ..	7	4	11	55
IX ..	8	6	14	70
X ..	5	8	13	65
XI ..	7	11	18	90
XII ..	6	9	15	75
XIII ..	5	6	11	55
XIV ..	4	3	7	35
TOTAL EACH CASTE ..	49	51	100	
GRAND TOTAL	245	255		500

The method of selecting these 500 cases may be described more minutely. From Table XLV it will be *seen that they have been taken from the eight age-groups,* VII to XIV. At each of these ages there are a certain number from each caste who correspond to the month in average age, and who are also in the same grades in school. There is a second group of boys at each age who correspond in age with similar individuals in each of the other castes, but who may or may not be found in

corresponding grades. The age-group totals in our special group of 500 vary, from 35 at XIV to 90 at XI. The last line of the table indicates that we have five caste-groups of 49 boys each who are equal in age and in school progress, and five groups of 51 each who are equal in age but who are found in various classes in school.

As an example of the process of selection, we may take age VIII. The number of boys of each caste at this age who are found in the several school grades may be seen in Table XLVI.

TABLE XLVI

SHOWING CASTES AND SCHOOL GRADES AT AGE VIII

SCHOOL GRADES	CASTE GROUPS				
	X	M	S	B	K
I	9	8	2	4	7
II	4	7	4	4	8
III	4	7	2	9	18
IV		1	2	1	6
V		1	1		
Totals ..	17	24	11	18	39

At this age the Sikhs have the smallest total number, namely 11. The total number taken from age VIII cannot exceed that number. Other things being equal, it should be possible to pair off with the two Sikh boys in grade I, the four in grade II, and the two in grade III, boys of similar age-grade in the other four castes. As a matter of fact, it was found that two in grade I, *three* in grade II, and two in grade III could be so matched. This left one boy in grade II, and the three boys in grades IV and V, to be matched *in age only*

from the other castes. The method was to take these four in turn, and for each to choose the *first* boy of each of the other castes, who happened to be of the same age in months—the order being the original serial order of testing, itself a chance order. We have thus for age VIII sub-groups of 7 and 4 from each caste, as shown in the second line of Table XLV.

TABLE XLVII

SHOWING THE TOTAL AGE IN MONTHS OF THE SUB-GROUPS AND COMBINED GROUPS AT EACH AGE AND FOR EACH CASTE

AGE	SUB GROUP OR COMBINED GROUP	CASTES				
		X	M	S	B	K
VII	a. 7 ab. 11	27 56	26 56	26 51	26 55	26 55
VIII.. ..	a. 7 ab. 11	41 75	41 73	41 73	41 71	41 72
IX	a. 8 ab. 14	39 77	37 78	38 80	38 79	38 80
X	a. 5 ab. 13	32 81	32 79	28 72	32 82	31 80
XI	a. 7 ab. 18	46 96	46 97	45 100	46 90	46 98
XII	a. 6 ab. 15	30 76	29 76	31 96	26 76	30 76
XIII.. ..	a. 5 ab. 11	24 55	25 56	24 56	23 55	26 56
XIV.. ..	a. 4 ab. 7	24 36	22 35	22 35	23 36	24 44
TOTAL ..	a. 49 ab. 100	263 552	258 550	255 563	255 544	262 561

We may now observe the exactitude with which the average ages in these groups mutually agree. The figures in the body of Table XLVII show the total

number of months of age beyond the birthday indicated in the first column. Any of these numbers divided by the number of cases shown in column 2 will give the average age in months for the group. Thus at age IX the 8 cases in sub-group (*a*) are aged as follows: Christians, average age, IX years and $4\frac{7}{8}$ months; Muhammadans, IX years and $4\frac{5}{8}$ months; Sikhs, Brahmins and Khatris, IX years and $4\frac{6}{8}$ months; for the five groups of eight boys each there being no difference of more than a quarter of a month in average age. Similarly, for the *entire* IX-year groups of 14 boys each, the averages are IX years and $5\frac{7}{14}$, $5\frac{8}{14}$, $5\frac{10}{14}$, $5\frac{9}{14}$ and $5\frac{10}{14}$ months, respectively, there being no difference greater than $\frac{3}{14}$ of a month in average age.

§ (48) Grade-Distribution in the Special Group

We have said that the castes appear to differ in the proportionate number of boys in the several grades. We may examine these differences more minutely.

Tables XLVIII, XLIX, L and LI show the grade-distribution of the boys of each caste in the various groups that we have now to deal with.

As we have already pointed out (§ 17, Tables VI and VII), the percentages of boys of these five castes examined by us do not greatly differ at the several ages. It is only from age XI onward that the percentage of Christian boys in any age-group exceeds the general proportion of Christian boys to the total 929 cases. It is clear that any over-proportion of Christians found in the lower grades is not due to a greater proportion of younger boys.

An examination of Tables XLVIII and XLIX, and of their corresponding Figures LII and LIII, will make clear the fact that the Christians are crowded into the

earlier grades. Age for age, therefore, they, more than others, are found in the lower classes.

A priori this might be attributed to either (*a*) entering school later than the usual age; (*b*) misrepresentation of age; or (*c*) failing promotion for one or more years. These three possibilities may be taken up one by one.

Late Entering School. Educational opportunity for the Depressed Classes is a recent thing. Parents as yet are not always convinced of the advantage of schooling, and often have to be urged to permit their boys to go to school. In most cases a Primary or Middle school education is all that they look forward to, and it is natural that many should enter school at a more advanced age than is common among other classes in cities and towns where school traditions are current and the value of schooling is recognized.

TABLE XLVIII

GRADE-DISTRIBUTION BY CASTES, 929-GROUP

GRADE	X	M	S	B	K
I ..	23	13	13	12	12
II ..	21	18	9	12	16
III ..	16	15	8	13	22
IV ..	11	8	10	13	17
V ..	11	20	23	16	14
VI ..	13	14	18	10	9
VII ..	3	7	10	8	6
VIII ..	2	4	3	9	2
IX ..		1	6	6	2
X ..		1		1	1
TOTAL YEARS ..	327	410	466	459	388

TABLE XLIX

GRADE-DISTRIBUTION BY CASTES, 500-GROUP

GRADE	X	M	S	B	K
I ..	19	8	12	7	7
II ..	22	16	8	14	11
III ..	21	14	10	13	18
IV ..	11	8	11	13	16
V ..	11	23	25	21	19
VI ..	11	18	21	13	13
VII ..	4	10	7	9	9
VIII ..	1	3	3	7	3
IX ..			3	3	4
TOTAL YEARS ..	327	431	453	455	443

TABLE L (*a*)

GRADE-DISTRIBUTION BY CASTES, 245-GROUP

GRADE	X	M	S	B	K
I ..	8	6	8	7	7
II ..	7	9	7	9	8
III ..	10	9	9	7	9
IV ..	4	5	4	6	5
V ..	8	8	9	8	7
VI ..	8	8	8	8	9
VII ..	3	3	2	3	4
VIII ..	1	1	2	1	
TOTAL YEARS ..	185	188	188	187	187
TOTAL YEARS %	370	376	376	374	374

TABLE L (*b*)

GRADE-DISTRIBUTION BY CASTES, 255-GROUP

GRADE	X	M	S	B	K
I ..	11	2	4		
II ..	15	7	1	5	3
III ..	11	5	2	6	9
IV ..	7	3	6	7	11
V ..	3	15	16	13	12
VI ..	3	10	13	5	4
VII ..	1	7	4	6	5
VIII ..		2	2	6	3
IX ..			3	3	4
TOTAL YEARS ..	142	243	265	268	256
TOTAL YEARS %	284	486	530	536	512

TABLE LI

GRADE DISTRIBUTION BY CASTES, 435-GROUP
(Percentage Distribution)

GRADE	X	M	S	B	K
I	16	7	9	3	3
II	24	15	8	14	12
III	21	11	8	14	17
IV	10	7	10	10	15
V	10	24	25	22	21
VI	13	21	24	15	14
VII	5	12	8	10	10
VIII	1	3	4	8	3
IX			4	4	5
TOTAL YEARS %..	338	452	482	483	466

earlier grades. Age for age, therefore, they, more than others, are found in the lower classes.

A priori this might be attributed to either (*a*) entering school later than the usual age; (*b*) misrepresentation of age; or (*c*) failing promotion for one or more years. These three possibilities may be taken up one by one.

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TABLE XLVIII

GRADE-DISTRIBUTION BY CASTES, 929-GROUP

GRADE	X	M	S	B	K
I ..	23	13	13	12	12
II ..	21	18	9	12	16
III ..	16	15	8	13	22
IV ..	11	8	10	13	17
V ..	11	20	23	16	14
VI ..	13	14	18	10	9
VII ..	3	7	10	8	6
VIII ..	2	4	3	9	2
IX ..		1	6	6	2
X ..		1		1	1
TOTAL YEARS ..	327	410	466	459	388

TABLE XLIX

GRADE-DISTRIBUTION BY CASTES, 500-GROUP

GRADE	X	M	S	B	K
I ..	19	8	12	7	7
II ..	22	16	8	14	11
III ..	21	14	10	13	18
IV ..	11	8	11	13	16
V ..	11	23	25	21	19
VI ..	11	18	21	13	13
VII ..	4	10	7	9	9
VIII ..	1	3	3	7	3
IX ..			3	3	4
TOTAL YEARS ..	327	431	453	455	443

TABLE L (*a*)

GRADE-DISTRIBUTION BY CASTES, 245-GROUP

GRADE	X	M	S	B	K
I ..	8	6	8	7	7
II ..	7	9	7	9	8
III ..	10	9	9	7	9
IV ..	4	5	4	6	5
V ..	8	8	9	8	7
VI ..	8	8	8	8	9
VII ..	3	3	2	3	4
VIII ..	1	1	2	1	
TOTAL YEARS ..	185	188	188	187	187
TOTAL YEARS %	370	376	376	374	374

TABLE L (*b*)

GRADE-DISTRIBUTION BY CASTES, 255-GROUP

GRADE	X	M	S	B	K
I ..	11	2	4		
II ..	15	7	1	5	3
III ..	11	5	2	6	9
IV ..	7	3	6	7	11
V ..	3	15	16	13	12
VI ..	3	10	13	5	4
VII ..	1	7	4	6	5
VIII ..		2	2	6	3
IX ..			3	3	4
TOTAL YEARS ..	142	243	265	268	256
TOTAL YEARS %	284	486	530	536	512

TABLE LI

GRADE DISTRIBUTION BY CASTES, 435-GROUP
(Percentage Distribution)

GRADE	X	M	S	B	K
I	16	7	9	3	3
II	24	15	8	14	12
III	21	11	8	14	17
IV	10	7	10	10	15
V	10	24	25	22	21
VI	13	21	24	15	14
VII	5	12	8	10	10
VIII	1	3	4	8	3
IX			4	4	5
TOTAL YEARS % ..	338	452	482	483	466

FIGS. LII–LV GRADE DISTRIBUTION.

FIG. LII
500-GROUP

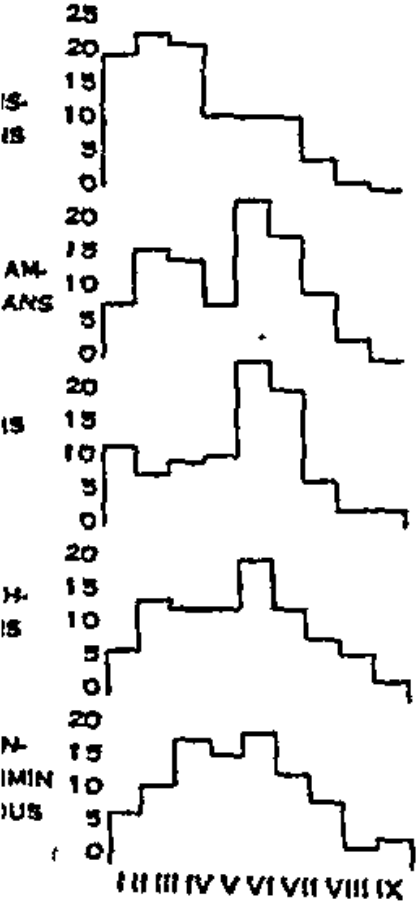


FIG. LII
929-GROUP

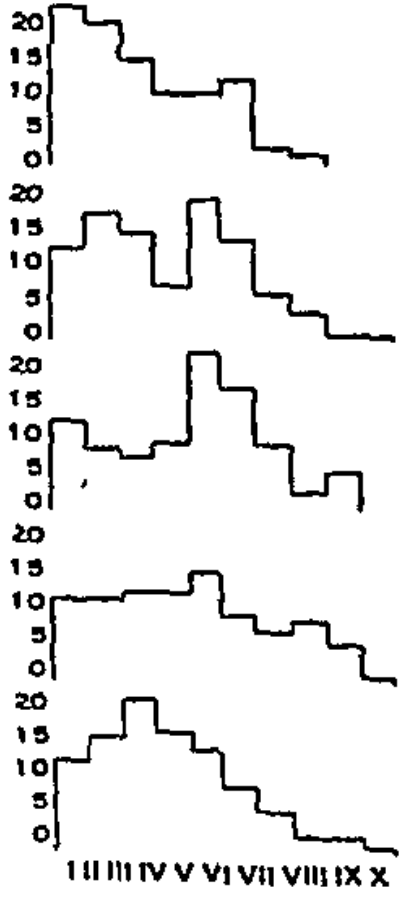


FIG. LIV a.
245-GROUP

FIG. LIV b.
255-GROUP

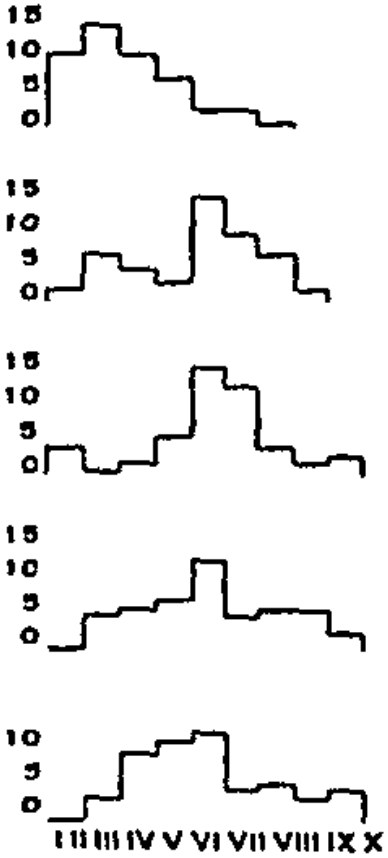
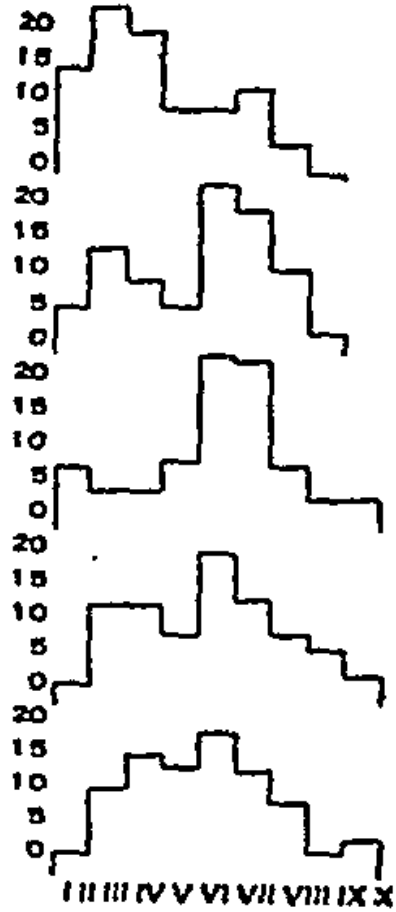


FIG. LV
435-GROUP



Mis-statement of Age. In this connection we may discuss not only the possibility of over-statement of age, but the general question of the falsification of age-records. There is always the possibility that the age of boys in school records may be over-stated or under-stated by their parents. These records are made when the boy is admitted to school, are transferred from one school to another, and remain a permanent entry in the admission register. It is from such registers that our age-records have all been taken (cf. § 3).

The only motive for over-stating a boy's age would be to get him admitted to the First Primary class before the minimum age of six. Such over-statement could hardly ever be more than a matter of a single year. This would occur only in a very small number of cases, and would, as far as mental test results are concerned, simply tone down the scores of a few very bright boys to something nearer the average. As a rule, village Christians are not as yet keen to put their children in school, and do not take the initiative in the matter. No motive for over-stating their boys' ages can, therefore, be assigned to them.

The chief motive for under-stating a boy's age is found in the hope that he may later enter into some department of Government service. There is an upper age-limit in the recruitment of all these services. If a parent wants his son to prepare for some such service, he may report his age to be as low as possible under the rules for school admission, so that at the end of his school and college career, even if he should have lost one or two years through failure in some examination or promotion, he may still be within the age-limit for acceptance in the service.

This motive again does not enter into the mind of a

village Christian when he sends his boy to school. He has no expectation of Government service. The H.I.Q.s of our Christian boys will not then be inflated by an under-statement of their age. And if the ages of any of the boys from the upper classes have been under-stated, and their capacity appears thus to be greater than it really is, it will only serve to make more conclusive the comparative ability represented by the scores of the Christian boys.

Failing Promotion. As to the possibility of Christian boys having an undue share of non-promotions, and thus falling back into unexpectedly low classes for their age, let us first examine the test results as they stand. It would appear that if there is in the Christian group an over-proportion of boys who have failed to earn promotions from year to year, i.e. of comparative dullards, it should be made manifest by an inferiority of test scores, age for age, and of H.I.Q.s in the total group.

§ (49) Test Results of the Special Group

In Table LVI we have reported the Median Point scores, Non-Verbal scores, Mental ages and H.I.Q.s of the five equal caste groups. These are shown separately for sub-group (a), in which 49 boys from each caste are matched, both in age and grade, and for the combined group (ab), of 100 boys from each caste, matched in age only. As the total age of each group is exactly the same, it is legitimate to compare the scores and mental ages as well as the H.I.Q.s. In the last line of the table the H.I.Q.s previously reported for the five entire caste groups are repeated for comparison.

If we examine the H.I.Q.s we find that, in the groups of 49 matched boys, the Christian H.I.Q. increases to 109, while all others decrease to 100 and 94. In the groups of

100 the Brahmins retain their place at 106, Muhammadans and Sikhs are as before, Khatris fall 1.5 points, but Christians rise from 99.5 to 104.

TABLE LVI

MEDIAN POINT SCORES, NON-VERBAL SCORES, MENTAL AGES AND H.I.Q.S FOR GROUPS OF 245 AND 500

MEASURE		CASTES					TOTAL		
	Group	X	M	S	B	K	Med.	25%–75%	Q.
P.S. ..	49	98	93	91	88	77	93	61–112	25.5
	100	96	96	100.5	97.5	93	97	72–115	21.5
N.V.S. ..	49	22	23	23	21	18	22	16– 26	5
	100	22	23	24	23	21.5	23	18– 27	4.5
M.A. ..	49	140	128	125	121	111	128	99–160	30.5
	100	134	134	142	137	128	134	106–162	28
H.I.Q. ..	49	109	100	94	100	94	99	87–115	14
	100	104	101	101.5	106	99.5	104	89–118	14.5
H.I.Q. Total ..	929	99.5	101	101.5	107	101	101	89–117	14

We may now dismiss from mind the possibility suggested in the previous section, that the over-proportion of Christian boys in classes below the expected age might be due to excessive dullness and hence to failure to win promotion. The test results would, in such a case, have brought their inferior capacity to light. On the contrary, they certainly have not suffered in comparison with others by our method of selection, and if there be an unequal factor in the selection we must find it elsewhere.

Is it possible that the opposite has been the case, and that all other castes have suffered by being forcibly matched with boys who are less advanced in school?

village Christian when he sends his boy to school. He has no expectation of Government service. The H.I.Q.s of our Christian boys will not then be inflated by an under-statement of their age. And if the ages of any of the boys from the upper classes have been under-stated, and their capacity appears thus to be greater than it really is, it will only serve to make more conclusive the comparative ability represented by the scores of the Christian boys.

Failing Promotion. As to the possibility of Christian boys having an undue share of non-promotions, and thus falling back into unexpectedly low classes for their age, let us first examine the test results as they stand. It would appear that if there is in the Christian group an over-proportion of boys who have failed to earn promotions from year to year, i.e. of comparative dullards, it should be made manifest by an inferiority of test scores, age for age, and of H.I.Q.s in the total group.

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If we examine the H.I.Q.s we find that, in the groups of 49 matched boys, the Christian H.I.Q. increases to 109, while all others decrease to 100 and 94. In the groups of

100 the Brahmins retain their place at 106, Muhammadans and Sikhs are as before, Khatris fall 1.5 points, but Christians rise from 99.5 to 104.

TABLE LVI

MEDIAN POINT SCORES, NON-VERBAL SCORES, MENTAL AGES AND H.I.Q.S FOR GROUPS OF 245 AND 500

MEASURE		CASTES					TOTAL		
	Group	X	M	S	B	K	Med.	25%–75%	Q.
P.S. ..	49	98	93	91	88	77	93	61–112	25.5
	100	96	96	100.5	97.5	93	97	72–115	21.5
N.V.S. ..	49	22	23	23	21	18	22	16– 26	5
	100	22	23	24	23	21.5	23	18– 27	4.5
M.A. ..	49	140	128	125	121	111	128	99–160	30.5
	100	134	134	142	137	128	134	106–162	28
H.I.Q. ..	49	109	100	94	100	94	99	87–115	14
	100	104	101	101.5	106	99.5	104	89–118	14.5
H.I.Q. Total ..	929	99.5	101	101.5	107	101	101	89–117	14

We may now dismiss from mind the possibility suggested in the previous section, that the over-proportion of Christian boys in classes below the expected age might be due to excessive dullness and hence to failure to win promotion. The test results would, in such a case, have brought their inferior capacity to light. On the contrary, they certainly have not suffered in comparison with others by our method of selection, and if there be an unequal factor in the selection we must find it elsewhere.

Is it possible that the opposite has been the case, and that all other castes have suffered by being forcibly matched with boys who are less advanced in school?

Strange to say, it is entirely possible. Let us suppose that in most cases the cause of Christian boys' grade-retardation is that they have started to school at an advanced age, and that non-Christian boys in the same low grade location are as a rule not those who have started late, but those who have failed to win promotions. If we now have a Christian boy of 10 years of age who is in the second grade, and seek to match with him a non-Christian boy of the same age-grade, we are likely to find a dull boy who has been put back two or three times for lack of capacity to go ahead. We may have matched a Christian who is quite normal or even superior in mental capacity, but has suffered merely for lack of school opportunity, with a Hindu or Muhammadan who has definitely proven himself to be dull.

If we could again find access to all the school registers, it would be quite feasible to inquire into the school history of all our boys, and discover whether and in how many individual cases this hypothetical ill-mating, detrimental to the non-Christian boy, has, as a matter of fact, taken place. Unfortunately, we did not anticipate our need of these data, and it is not possible to secure them now. Failing this, we may examine further the facts available with regard to school progress.

§ (50) The Elimination of Retardates from the Special Group

A careful examination of Table XLVIII and Figure LII suggests a study of the comparative amount of grade-retardation found in our five caste groups. We may take as a conservative basis the following: A boy of V, VI or VII may reasonably be expected to be found in Grade I. At VIII a boy in Grade I is certainly

one year retarded. Starting from this point, we may classify as

	Retarded 1 year	Retarded 2 years	Retarded 3 years	Retarded 4 years	Retarded 5 years
Boys VIII years of age, found in	Grade I				
„ IX „ „ „	„ II	Grade I			
„ X „ „ „	„ III	„ II	Grade I		
„ XI „ „ „	„ IV	„ III	„ II	Grade I	
„ XII „ „ „	„ IV	„ III	„ II	„ I	
„ XIII „ „ „	„ V	„ IV	„ III	„ II	Grade I
„ XIV „ „ „	„ V	„ IV	„ III	„ II	„ I

This scheme need not be elaborately defended. It is not too rigid, and it recognizes the natural break in school life after the "Fifth Primary," when boys often leave rather than continue into the Middle School. The scheme is as good as any that could be devised for comparing the school progress of our five caste-groups.

On the above basis we find that

of 170 Christian boys, 95 or 55% are retarded—average no. of years retarded 1.84
„ 185 Muhammadan boys, 40 or 23% are retarded—average no. of years retarded 1.73
„ 124 Sikh „ 15 „ 12% „ „ „ 1.87
„ 152 Brahmin „ 22 „ 14% „ „ „ 1.68
„ 263 N.-B. Hindus „ 53 „ 20% „ „ „ 1.53

The proportion of Christian boys retarded is from two to four times as great as that of the other castes, and the average amount of retardation per boy is greater than that in three other castes, and almost as great as that in the fourth.

In the selection of the sub-groups of 49 in the special experimental group, it seems certain that to find exact matches for the 49 Christians it will be necessary to take more than the general proportion of retardates from the other castes. We have already stated that retardates from non-Christian castes are less often so on account of late starting in school than would be true in the case of Christians. It seems certain, therefore, that the

great comparative increase in the Christian H.I.Q. and decrease in the non-Christian H.I.Q. in the 245-group is due to this factor.

As we have not the data for matching our boys on the *triple* basis of age, grade, and *years of schooling*, we may do the next best thing, namely, eliminate all matches of which the boys are to be classified as retarded on the basis mentioned above. This will, no doubt, by omitting a large number of dullards, raise our average H.I.Q.s above those of the general unselected population in the several caste groups, but for comparative purposes it should give us very significant measures.

TABLE LVII

BOYS OMITTED FROM SPECIAL GROUP BECAUSE OF RETARDATION

X AGE-GRADE	M AGE-GRADE	S AGE-GRADE	B AGE-GRADE	K AGE-GRADE
VIII—1	VIII—1	VIII—1	VIII—1	VIII—1
VIII—1	VIII—1	VIII—1	VIII—1	VIII—1
IX—1	IX—2	IX—1	IX—1	IX—1
IX—1	IX—2	IX—1	IX—1	IX—1
X—1	X—3	X—4	X—4	X—4
XI—2	XI—2	XI—2	XI—2	XI—2
XI—3	XI—3	XI—3	XI—2	XI—3
XI—4	XI—4	XI—5	XI—4	XI—4
XII—3	XII—3	XII—3	XII—3	XII—3
XII—3	XII—3	XII—3	XII—4	XII—3
XIII—4	XIII—4	XIII—4	XIII—4	XIII—4
XIII—5	XIII—5	XIII—5	XIII—5	XIII—5
XIV—5	XIV—5	XIV—5	XIV—5	XIV—6
13	13	13	13	13 Total 65

In the above table are shown by castes all the cases in the sub-groups of 49 who are to be called retarded.

The table is to be read: Christians, 2 boys of VIII years of age in the 1st Grade; 2 boys of IX years in the 1st Grade; etc. These discarded cases are 13 in number in each caste, making 65 in all. Table LVIII shows the numbers remaining after reducing our special group from 500 to 435.

TABLE LVIII

SHOWING NUMBERS OF BOYS OF EACH CASTE IN THE VARIOUS SCHOOL GRADES, AFTER ELIMINATION OF RETARDATES (GROUP OF 435)

GRADES	CASTES					
	X	M	S	B	K	
I	14	6	8	3	3	
II	21	13	7	12	10	
III	18	10	7	12	15	
IV	9	6	9	9	13	
V	9	21	22	19	18	
VI	11	18	21	13	12	
VII	4	10	7	9	9	
VIII	1	3	3	7	3	
IX			3	3	4	
	87	87	87	87	87	Total 435

We are now left with reduced sub-groups (*a*) made up of 36 matched boys from each caste, 180 in all; and sub-groups (*b*) as before, of 51 boys each, 255 in all, which remain unchanged, as these boys were selected only by age, not grade.

We may again examine Tables XLVIII to LI. Table XLVIII shows the percentages of boys of each caste in the various school grades. Table XLIX is easily comparable with this, for in the 500-group there are 100 in each caste, and the *number* of boys per grade is also a

percentage. Table L (*a*) represents the original sub-groups (*a*) of 49 boys each, and Table L (*b*), the sub-groups (*b*) of 51's. The figures of these two tables represent *numbers* of boys in each grade, but if the numbers are doubled they will become approximate percentages, suitable for comparison with the two preceding tables.

Now taking the lowest lines of the tables, we may note the total years in school represented by the 100 boys of each caste in the 500-group, and similarly the total years in school *per 100 boys* in the other groups. Thus in Table XLVIII (x),

the 23 boys in the first grade count 23 years
" 21 " second " 42 "
" 16 " third " 48 " etc.,

totalling 327 years in school, or an average of 3.27 years per boy. By comparing these figures for the 929-group, the 245-group, the 255-group, and the 500-group, we see that the Christians in the 245-group have had 43 more years per cent. in school than in the 929-group; in the 255-group they have had 43 years per cent. less than in the 929-group; and in the 500-group, exactly their normal number of school years per cent. Similarly,

	929-group	245-group	255-group	500-group
Muhammadans	410 yrs. %	376 yrs. %	486 yrs. %	431 yrs. %
Sikhs	466 "	376 "	530 "	453 "
Brahmins	459 "	374 "	536 "	455 "
N.-B. Hindus	388 "	374 "	512 "	443 "

On the whole, in the 245-group (the doubly matched group) all but the Christians are far below their normal total school advancement, and the Christians, on the contrary, are high above theirs. In the 255-group the situation is reversed. The Christians have less, and the others, without exception, more. In the 500-group the process of equalization is seen. The Christians are left exactly the same as in the 929-group; Muhammadans,

Sikhs and Brahmins at virtually the same figure, but non-Brahmin Hindus at 55 years per cent. more.

When the 65 retarded boys are omitted we have the 435-group remaining as shown in Table LVIII, Table LI, and Figure LV. In this modified group the total numbers of years of schooling represented by the 87 boys of each caste are 338, 452, 482, 483, and 466, respectively; or, as compared with the 929-group, X, + 11; M, + 42; S, + 16; B, + 24; and K, + 78. In this respect, all have profited to some extent by the selection, but Christians least of all. We believe that the comparative showing made by the five castes in this group should be regarded as significant. So far as the Christians are concerned, it seems that we have done everything possible to avoid giving them an undue advantage.

The test results for the 435-group are shown in Table LIX.

TABLE LIX[1]

H.I.Q.S OF THE REDUCED GROUP OF 435 BOYS

TOTAL GROUP	EACH CASTE	X	M	S	B	K	TOTAL	25%–75%	Q.
180	(36)	110.5	108.5	104	105	97.5	106	92–110	9
435	(87)	106	103	105	109	106	105	92–120	14
245	(49)	109	100	94	100	94	99	87–115	14
500	(100)	104	101	101.5	106	99.5	104	89–118	14.5
929		99.5	101	101.5	107	101	101	87–117	14

In the 435-group the Brahmins have a median H.I.Q. of 109, the Christians and non-Brahmin Hindus of 106, the Sikhs of 105, and the Muhammadans of 103. The median H.I.Q. of the Christians is one point above that of the entire group.

[1] This table shows also for comparison the H.I.Q.s of the other selected groups, and of the total.

In the reduced sub-groups (*a*), now containing 36 boys each, we find that Christians and Muhammadans gain the most in comparison with other castes by the age-grade selection, standing at 110.5 and 108.5 respectively, while the other castes fall to 104, 105, and 97.5. It will be remembered that the Muhammadans were second in the number of retarded boys per cent., and, in what is often called nowadays "the backward state of Muhammadan education," it is likely that what has been said of the Christian boys with reference to late starting may be true, though in a less degree, of the Muhammadans in comparison with the other non-Christian castes.

Summary of § 50. We may now summarize the results of our comparison of the Christian group with the various non-Christian caste-groups.

(1) Taking the school population as we find it, and making no allowance for school-grade or apparent retardation, we find the H.I.Q. of the Brahmin group to be 107; of the Sikh group, 101.5; of the Muhammadan and non-Brahmin Hindu groups, 101; and of the Christian group, 99.5.

(2) Taking 49 from each caste and matching them evenly boy for boy by age in months and by school-grade, we have: Christians, H.I.Q. 109; Muhammadans and Brahmins, H.I.Q. 100; Sikhs and non-Brahmin Hindus, H.I.Q. 94.

(3) Taking with these 49 boys an additional 51 from each caste matched by age only, we have: Brahmins, H.I.Q. 106; Christians, H.I.Q. 104; Sikhs, H.I.Q. 101.5; Muhammadans, H.I.Q. 101; and non-Brahmin Hindus, H.I.Q. 99.5.

(4) Eliminating from these 500 boys 65 who are below the expected grade for their age, we have: Brah-

mins, H.I.Q. 109; Christians and non-Brahmin Hindus, H.I.Q. 106; Sikhs, H.I.Q. 105; and Muhammadans, H.I.Q. 103.

§ (51) The Overlapping of H.I.Qs in the Various Caste Groups

In Table XLIII (§ 45, p. 161) we have shown the H.I.Q. overlapping of the six caste-groups in the total 929 cases. We may show in a similar way this feature of the groups of 500 and 455. Tables LX and LXI are to be read in the same way as Table XLIII.

TABLE LX

H.I.Q. OVERLAPPING OF THE CASTE GROUPS, 500 CASES

NUMBER AND PER CENT. OF	TOTAL NUMBER	No. & % of MEDIAN (100)	No. & % of MEDIAN (104)	No. & % of MEDIAN (101)	No. & % of MEDIAN (99)	No. & % of MEDIAN (96)	No. & % of MEDIAN (93)	No. & % of MEDIAN (90)
Christians	100	No. 51 % 51	54 54	55 55	49 49	51 51	51 51	
Muhammadans ..	100	No. 45 % 45	49 49	49 49	42 42	51 51	46 46	
Sikhs	100	No. 46 % 46	50 50	49 49	44 44	50 50	46 46	
Brahmins	100	No. 55 % 55	59 59	55 55	51 51	61 61	55 55	
Non-Brahmin Hindus	100	No. 45 % 45	47 47	46 46	40 40	45 45	45 45	
TOTAL ..	500							

This table is to be read: Of the Christians, of whom there are a total of 100, 51, or 51 per cent, equal or exceed their own caste median (namely H.I.Q. 104); 56, or 56 per cent., equal or exceed the median of the Muhammadans (namely H.I.Q. 101); etc.

The following table is to be read similarly:

TABLE LXI

H.I.Q. OVERLAPPING OF THE CASTE-GROUPS, 435 CASES

NUMBER AND PER CENT. OF	TOTAL NUMBER	WHO EQUAL OR EXCEED THE MEDIAN OF					
		X Med. H.I.Q. (106)	M Med. H.I.Q. (103)	S Med. H.I.Q. (105)	B Med. H.I.Q. (109)	K Med. H.I.Q. (106)	TOTAL MED. H.I.Q. (105)
Christians	87	No. 45 % 55	47 54	45 55	39 45	45 55	45 55
Muhammadans ..	87	No. 39 % 45	44 50	40 46	37 42.5	39 45	40 46
Sikhs	87	No. 43 % 49.4	47 54	44 50	40 46	43 49.4	44 50
Brahmins	87	No. 50 % 57.4	54 62	52 59.7	45 55	50 57.4	52 59.7
Non-Brahmin Hindus	87	No. 40 % 46	46 53	43 49.4	34 39	40 46	43 49.4
TOTAL ..	435						

§ (52) Direct Comparison of Groups

The foregoing four sections have led us by a somewhat circuitous route to the conclusion that no essential inferiority of the Depressed Class group can be demonstrated, and that such differences as are found between the several caste groups are slight. No attempt has as yet been made to measure the amount of these differences, or to estimate their significance.

Happily, we have at hand a straightforward method of measuring the reliability of the difference between the mean scores of two comparable groups. This method takes into consideration the actual magnitude of the difference and also the variability (sigma), and the

number of cases. In employing this recognized statistical procedure upon the sub-groups of the 500 cases already equated in age, we may dispense with the H.I.Q. ratios, and deal with Point scores only.

Table LXII-sets forth the Point score averages and Sigmas, and the Probable Errors of the averages for the experimental groups.[1]

TABLE LXII

MEAN SCORE, SIGMA, AND P.E. (av.): EXPERIMENTAL GROUPS

CASTE GROUP	NO. OF CASES	AVERAGE POINT SCORE	SIGMA	SIGMA (av.) $=$ SIG./$\sqrt{N}$	PROBABLE ERROR (av.) $=.6745$ SIG. (av.)
X	36	91.19	27.8	4.63	3.12
X	49	92.2	27.568	3.935	2.65
X	51	90.3	25.357	3.545	2.393
X	100	91.2	26.382	2.638	3.16
X	87	92	26.580	2.85	3.764
M	49	87.5	27.568	3.94	2.655
M	51	94.8	26.851	3.76	2.535
M	100	91.2	27.295	2.729	1.84
M	87	92.4	26.349	2.825	1.908
S	49	85.9	32.22	4.61	3.106
S	51	100.8	28.24	3.96	2.67
S	100	93.5	31.032	3.103	2.093
S	87	95.4	31.257	3.352	2.26
B	49	84.0	29.682	4.24	2.856
B	51	103.3	21.071	2.95	1.99
B	100	93.8	27.568	2.757	1.858
B	87	97.3	24.684	2.648	1.785
K	49	79.0	31.161	4.45	3.0
K	51	99.5	28.575	4.0	2.7
K	100	89.4	31.0	3.10	2.088
K	87	93.4	31.386	3.365	2.268

[1] *Note.*—Statistical formulæ used in this section are:

(*a*) Standard Error of Mean, (SIGMA av.) $= \frac{\text{SIGMA (distribution)}}{N}$

(*b*) Probable Error of Mean (P.E. av.) $= .6745$ SIGMA (av.)

(*c*) Probable Error of Difference between two Means (P.E. diff.) $= \sqrt{\text{P.E.}^2 \text{ av. (1)} + \text{P.E.}^2 \text{ av. (2)}}$

(*d*) The ratio of the Difference to the P.E. of the Difference $\frac{D}{\text{(P.E. diff.)}}$ should be at least 4.0 in order to indicate a significant and reliable difference between the groups compared.

TABLE LXII

MEAN SCORE, SIGMA, AND P.E. (av.): EXPERIMENTAL GROUPS (*Contd.*)

CASTE GROUP	NO. OF CASES	AVERAGE POINT SCORE	SIGMA	SIGMA (av.) $=\text{SIG.}/\sqrt{N}$	PROBABLE ERROR (av.) $=.6745$ SIG (av.)
Total Groups (All Castes)					
Total	245	85.65	30 07	1.925	1.297
Total	255	97.58	26.75	1.675	1.129
Total	500	91.73	29 13	1.303	.878
Total	435	93.74	28 28	1.356	.914
Total	180	88.4	29.60	2 202	1.485

In Table LXIII, which follows, the Differences (D) are computed directly from column 3 of the previous table. The Probable Error of the Difference is calculated by the formula given in the note.

TABLE LXIII

DIFFERENCES AND P.E. OF DIFFERENCES: EXPERIMENTAL GROUPS

GROUPS COMPARED	DIFFERENCE	SUM OF SQUARES OF P.E. av's.	PROBABLE ERROR OF DIFFERENCE	D / P.E. diff.
X 49 M 49	4.7	14 073	3.75	1.25
X 51 M 51	4.5	12.160	3.49	1.29
X 100 M 100	0.0	6.456	2.56	0.0
X 87 M 87	0 4	7.404	2.73	.15
X 49 S 49	6.3	16.668	4.09	1.54
X 51 S 51	10.5	12.859	3 59	2.92
X 100 S 100	2.3	7.542	2.75	.84
X 87 S 87	3.4	8.872	2.98	1.14
X 49 B 49	8.2	15.175	3 90	2.10
X 51 B 51	13.0	9.69	3.12	4.17
X 100 B 100	2.6	6.612	2.58	1.01
X 87 B 87	5.3	6.950	2.64	2.0
X 49 K 49	13.2	16 023	4.01	3 29
X 51 K 51	9.2	13.02	3.61	2.55
X 100 K 100	1.8	7.522	2.75	.65
X 87 K 87	1.4	8.907	2.99	.47
X 36 Total 180	2.79	11.939	3.47	1.24
X 49 Total 245	6.55	8.705	2.96	2 21
X 51 Total 255	7.28	7.026	2.65	2.75
X 100 Total 500	0.53	3.931	1.98	.27
X 87 Total 435	1.74	4.599	2.15	.81

TABLE LXIII

DIFFERENCES AND P.E. OF DIFFERENCES: EXPERIMENTAL GROUPS (*Contd.*)

GROUPS COMPARED	DIFFERENCE	SUM OF SQUARES OF P.E. av's.	PROBABLE ERROR OF DIFFERENCE	D / P.E. diff.
M 49 S 49	1 6	16.695	4.08	.39
M 51 S 51	6.0	13.559	3.69	1.62
M 100 S 100	2.3	7.762	2.79	.82
M 87 S 87	3.0	8.748	2.96	1.01
M 49 B 49	3.5	15.202	3.90	.77
M 51 B 51	6.5	10.39	3.23	2.63
M 100 B 100	2.6	6.838	2.64	.99
M 87 B 87	4.9	6.826	2.61	1.87
M 49 K 49	8.5	16.05	4.01	2.12
M 51 K 51	4.7	13.72	3.71	1.27
M 100 K 100	1.8	7.748	2.79	.64
M 87 K 87	1.0	8.783	2.97	.34
S 49 B 49	1.9	17.797	4.22	.45
S 51 B 51	2.5	11.089	3.34	.75
S 100 B 100	0.3	7.834	2.8	.11
S 87 B 87	1.9	8.294	2.86	.69
S 49 K 49	6.9	18 645	4.32	1.59
S 51 K 51	1.3	14.419	3.81	.33
S 100 K 100	4.1	8.744	2.96	1.38
S 87 K 87	2.0	10.251	3.21	.62
B 49 K 49	5.0	17.152	4.15	1.20
B 51 K 51	3.8	11.250	3.36	1.13
B 100 K 100	4.4	7.814	2.80	1.57
B 87 K 87	3.9	8.329	2.89	1.35
M 100 **Total** 500	0.53	4.157	2.04	.26
M 87 **Total** 435	1.34	4 475	2.12	.63
S 100 **Total** 500	1.77	5.153	2.27	.78
S 87 **Total** 435	1.66	5.943	2.44	.68
B 100 **Total** 500	2.07	4.223	2.06	1.00
B 87 **Total** 435	3.56	4.021	2.01	1.77
K 100 **Total** 500	2.33	5.133	2.27	1.03
K 87 **Total** 435	0.34	5.978	2.45	.14

The ratios shown in column 5 of the previous table are now to be examined. By formula (*d*) only those can be taken as indicative of significant and reliable differences which are 4.0 or above in value. In the first column of the table we have shown in bold type the group whose mean score in question is greater. The

table may be read: "When we compare the groups X 49 and M 49, we find that the mean Point score of X 49 is 4.7 points greater—but that the difference is only 1.25 times the probable error of the difference, i.e. is not sufficiently great to be reliable and significant"; etc.

In the 21 cases in which X groups are thrown into comparison with other groups, only one results in a difference large enough to command confidence. This is the case of the 51 Christian and 51 Brahmin boys matched exactly in age, but falling where they may in school grade. In this case the benefit of the comparison goes to the B group, whose average number of years in school, however, is 5.36, while that of the X group in question is but 2.84 (cf. Table L (*b*), p. 169).

§ (53) Summary

We have tried to be very careful not to be led away by a desire to make the Christian boys from the Depressed Classes appear better than they are. To find, as we have done (§ 45), that, taking them as they come in the schools, with no further selective process at work than that which has placed them in school, 38 per cent. of them equal or exceed the median H.I.Q. of the Brahmins, and that 47 per cent. equal or exceed the median H.I.Q. of the entire population, should sufficiently gratify any sentiment favourable to their emancipation.

But noting again how new the schools are which are open to them, how recent their desire for education, how late many of them start, and how low in the grades for their age they seem as yet when compared with other boys, it seems only fair to see what they can do in comparison with others of equal age, opportunity and length of time in school. This comparison should be made in more complete form in later studies.

Taking the data available now, we first matched our Christian boys with all other castes by age and grade (§ 49, 245-group). In this group 30 out of 49, or 61 per cent., equal or exceed the median H.I.Q. of the Brahmins, and the same per cent. equal or exceed the median of the total group including all castes.

Noting what seems to be an unequal factor in this selection, we eliminated 65 boys from this group, cutting out 13 apparently retarded boys from each caste. In the remaining group of 180, 22 boys out of 36, or 61 per cent., are again found to equal or exceed the median H.I.Q. of the Brahmins, and also of the total group, including all five castes.

Now, adding to these 180 255 more (51 from each caste), matched only by age, allowing the shortness of time in school to work against whom it might, and retardation against whom it might, we examined the resulting group of 435, 87 from each caste, and still found that 39 out of 87, or 45 per cent., of the Christians equal or exceed the median H.I.Q. of the Brahmins, and 45 out of 87, or 55 per cent., equal or exceed the median of the whole group including all castes.

Finally, led by the desire to discover just how great such differences might be, and whether they would operate to consign our X group to an inferior status, we compared each comparable pair of groups in terms of the actual magnitude of their difference, taking account of the number of cases and their variability. We discovered that:

(*a*) In no case is there a significant difference between Christian and other groups when boys are matched both in age and school-grade (groups of 49).

(*b*) In one case only is there a significant difference between the Christian group and other groups matched only in age (groups of 51).

(*c*) In no case is there a significant difference between Christian and other groups when all matched cases, or all such omitting retardates, are included (groups of 100 and 87).

(*d*) In no case is there a significant difference between Christian groups and the respective total groups in which they are included.

It is impossible to conclude that we have in these boys an essentially inferior mentality.

§ (54) The Supposed Upper Limit or "Dead Line"

The popular opinion is sometimes expressed that boys from the Depressed Classes are quite capable of going on in school up to a certain point, but that when this point is reached they have found their limit, and are thenceforth out-classed in the competition with other castes. We have not the data for a full examination of this point, but we may show the distribution of the H.I.Q.s of our 170 Christian boys by ages, and examine them for any evidence of a falling off at a particular age, or in the upper ages in general.

Table LXIV exhibits the distribution of 170 H.I.Q.s, each vertical column representing one age from V to XVI. The first two and last two ages are inconclusive for lack of numbers. Table LXV shows the medians and the range of the middle 50 per cent. of H.I.Q.s for the same group, age by age.

Examination of these two tables reveals no such "dead line" at any point from age VII to age XIV, nor any marked tendency to a diminution of H.I.Q.s in the upper ages. As far as our test records furnish evidence on the point, we may say that the "dead line" seems to be a myth.

§ (55) The Outlook for the Depressed Classes

In conclusion, we may state that our tests fail to discover any essential disability in the boys who have come from the Depressed Classes in the Panjab. It is not now surprising to us to note Risley's remark as to the racial stock of the Chuhras. That writer, who cites the Chuhra, with the Rajput, as characteristic Indo-

TABLE LXIV

DISTRIBUTION OF TOTAL CHRISTIAN GROUP H.I.Q.s, 170 CASES (AGES V TO XVI)

AGES	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	
								63					
							76	70					
					59	79	77	70					
					65	82	77	76		63			
				72	66	83	78	77	70	64			
				79	70	85	79	81	76	71			
			64	84	72	85	83	83	83	78			
			74	85	86	86	87	88	87	79			
			81	92	90	88	90	88	93	88	75		
		70	90	98	92	88	99	89	95	88	84		
		85	100	100	98	90	104	90	98	89	88		
	65	107	102	105	100	91	104	99	103	92	89	100	
MEDIAN				106		92	106			93			
	87	123	110	113	103	96	107	99	109	96	89	100	
		136	111	115	104	103	108	100	109	98	93		
		130	112	115	106	112	109	103	111	99	105		
			115	117	111	114	110	104	116	106	106		
			119	117	113	120	112	106	117	107			
			140	121	121	122	112	110	120	109			
				139	122	128	114	111	123	126			
				152	129	129	114	115	128	126			
					130	150	124	116		127			
					137	151	131	120					
							136	125					
								141					
TOTAL NUMBER OF BOYS	2	6	12	17	20	21	23	24	16	19	8	2	170

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